F03-006,1 2. Review No. 1. Date: 1/05/04 **REVIEW COMMENT RECORD (RCR)** 3. Project No. 5. Document Number(s)/Title(s) 8. Organization/Group 6. Program/Project/Building Number 7. Reviewer Data Validation Report for WSCF20030757 F6-35/373-3907 G.S. Thomas 17. Comment Submittal Approval: 10. Agreement with indicated comment disposition(s) 11. CLOSED Reviewer/Point of Contact Organization Manager (Optional) Reviewer/Point of Contract 4/23/04 Author/Originator 14. Reviewer 16. 15. Disposition (Provide 12. 13a. Comment(s) 13b. Basis 13c. Recommendation Concurrence Status Justification is NOT accepted) Item Required Data Validation Metals and Volatile Organics WSCF20030757 The wrong chain is attached in 1 Appendix 4. Data Validation Wet Chemistry WSCF20030757 1 The data validation report on page 1 first sentence under Hold Times section the word metals should be deleted and the words anions and cations be added.

ORP-1 (02/02	ORP - REVIEW COMME	NT RECORD (RCR)		Date Residue Project 200-P)3 lidation	Review No. A. Page	1 of	1
5. Doc	ument Number(s)/Title(s)	6. Program/Project/Building Number	1:	7. Reviewer 8. Organiza				9. Location	/Phone
	ents on Data Validation Report for Le Delivery Group WSCF20030757 (VSR 202)	Groundwater Protection - Fluor Hanford	Program	SJ Trent		EIS/SDM			1 Bldg 5869
17. Co	mment Submittal Approval Organization Manager (optional)	10. Agreement with indicated comment disposition(s) Contact Contact			1, show				
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1	Phosphate was validated and flagged validator was instructed to not validated. Qualification should be a should note that phosphate was not request.		مع	~~			. •		
2	Validator has validated ortho-terph this is a surrogate used in the WTM confirm w/ the laboratory. If confibe requested to remove validation ortho-terphenyl.	PH-D analysis. Will firmed, validator will		No -	funt evel.	سن ۸	forest	<u>.</u>	_
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	and should not be	validation.							
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Comme Sampl	nts on Data Validation Report for e Delivery Group WSCF20030461 (VSR 02)	Groundwater Protection Program So				EIS/SDM		Federa 373-	1 Bldg 5869
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1	Phosphate was validated and flagger validator was instructed to not va- results. Qualification should be should note that phosphate was not request.	lidate phosphate removed and validator		ت	ناد	- 1			
2	Validator has validated ortho-terp this is a surrogate used in the WT confirm w/ the laboratory. If con be requested to remove validation ortho-terphenyl.	PH-D analysis. Will firmed, validator will		→	_	n infe			
3	As noted by the validator, MS/MSD from the report for Al, U, Ba, Zn, has been requested to review there information was mistakenly left ou data package report if the MS/MSD retrieved.	and V. The laboratory reports to see if this t. Will submit revised		<i>Νο</i> γκει	bert indi	har in	Same		
	Note to validator on	I tom #Z- s a surrogate		·					
	and should not be	Validated.							

FAX

TECHLAW, INC.

3115 Loma Court Tenino, WA 98589 509-521-6693

To: Steve Trent

From: Bruce Christian

Pages: 1

Date: 26 November 2003

Information Request #9

WSCF20030757-Metals →

Was there a specific reason for not running a matrix spike duplicate or laboratory duplicate for the metals analysis??

Here is the e-mail that Steve received from the lab.

Doris here are answers to IR #12 and IR #9.

Steve

----Original Message-----From: Fitzgerald, Scot L

Sent: Wednesday, October 29, 2003 1:35 PM

To: Trent, Stephen J **Cc:** Trechter, John E Jr.

Subject: FW: Some more data validation questions ...

Steve,

Here is the information you requested. For Item number one there are two RPDs one for the sample/dup and one for the MS/MSD. The RPD differences would be expected under the conditions discussed below.

Scot

----Original Message----From: Baird, William W (Bill)

Sent: Wednesday, October 29, 2003 12:37 PM

To: Fitzgerald, Scot L

Subject: RE: Some more data validation questions...

1. The fluoride peak was noted in the comments to have an unidentified compound possibly interfering. The fluoride is flagged with a B and an X. The B is for the concentration being below the lowest cal std but above the MDL, the X is for the possible interfering peak. Here is a quote of the comments:

"IC: Fluoride, nitrite-N and phosphate-P detected, but at concentrations less than that of the lowest calibration level. Also unknown peak potentially interfering with fluoride, which is why matrix spike recoveries and the relative percent difference between the sample and dup are high."

The MS is 127% and the MSD is 120%. This could be accounted for if the sample result was biased low due to the possible interference.

I don't see any reference to a "few percent" in any of the comments in Labcore.

2. The MSD was not spiked (analyst error). Thus, it was not reported. If necessary, we can resurrect and report the unspiked result which could be used as a DUP of the sample.

Bill

----Original Message----From: Fitzgerald, Scot L

Sent: Tuesday, October 28, 2003 3:30 PM

To: Baird, William W (Bill)

Subject: FW: Some more data validation questions...

Bill,

Can you look into these for me?

Scot

----Original Message-----From: Neely, Michael

Sent: Tuesday, October 28, 2003 2:41 PM

To: Dale, Troy F; Fitzgerald, Scot L

Cc: Trechter, John E Jr.

Subject: FW: Some more data validation questions...

Troy/Scot:

More questions from Steve - please see below e-mail message.

Thanks,

Mike Neely

Phone: 509-373-0654 Cell: 509-528-2666

Pager: 509-373-PAGE, Extension 6730

FAX: 509-372-0456

----Original Message-----From: Trent, Stephen J

Sent: Tuesday, October 28, 2003 2:12 PM

To: Neely, Michael

Subject: Some more data validation questions...

Mike,

Some more questions from the validator -

- 1) WSCF20030461 The lab reports the fluoride RPD as 69%, but the MS/MSD RPD calculated by the validator is just a "few percent". Did the lab run a separate duplicate?
- 2) WSCF20030757 No MSD or lab duplicate data was provided for metals analysis is it available or was there a reason it is not presented in the data package?

Thanks in advance..

Steve

FAX

TECHLAW, INC.

3115 Loma Court Tenino, WA 98589 509-521-6693

To: Steve Trent

From: Bruce Christian

Pages: 1

Date: 26 November 2003

Information Request #10

WSCF20030757-VOA re-analysis (WACF20031236),

Do you want this data validated?

No

FAX

TECHLAW, INC.

3115 Loma Court Tenino, WA 98589 509-521-6693

To: Steve Trent

From: Bruce Christian

Pages: 1

Date: 26 November 2003

Information Request #11

WSCF20030459-rad WSCF20030461-rad WSCF20030613-rad WSCF20030757-rad

I'm not seeing any tracer/carrier yield data reported by WSCF. Is it in the package somewhere and I'm just not seeing it??

Information received from the laboratory and forwarded to Techlaw on 11/13/03

VALIDATION REPORT SAF NUMBER <u>F03-006</u> SDG NUMBER <u>WSCF20030757</u>

X DRAFT

____ FINAL

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(02/02	2)	•	-		Nov 24,	2003	ļ	N/A	
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Data	Package SDG WSCF20030757	Groundwater Protection	• [Bill Bnv & Science			ience	E6-35	
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1	Inorganics - pg l, TechLaw validati	on letter introduction				· · · · · · · · · · · · · · · · · · ·			
-	cites DOE/RL-2000-60 Draft B. Howev					10			C
	and is cited on pg 4.			corr		Jen .			ļ
2	Inorganics - Pg 12, Silver is flagg	ed as J rather than UR.		chan	رامع	in on	e .		
	Conflicts with Major deficiency sta								
3	Inorganics - Pg 17, This appears to	he the wrong chain of				/ .	·		
	custody, wrong sample numbers.	, he the wrong that of		مم	~~	ben .			C
4	Inorganics - pg 20, The accuracy se	estion of the checklist	<u> </u>		· · · · ·				
-	is incomplete.	ection of the checkinst		cor		1	•		
5	Radiochemistry - pg 1, TechLaw vali	3-L1							1
. .	introduction cites DOE/RL-2000-60 E					//			
	is in effect and is cited on pg 4	rate b. nonever hove		co	^				
6	PCBs - pg 1, TechLaw validation let	ter introduction cites							
	DOE/RL-2000-60 Draft B. However Rev	1 is in effect and is		ہم ا		· ·	•	,	
	cited on pg 4							.,	
7	Volatiles - pg 1, TechLaw validation	on letter, introduction				,			_
	cites DOE/RL-2000-60 Draft B. Howev	er Rev 1 is in effect		(00	-	Je		,	
	and is cited on pg 4		<u> </u>	<u> </u>					
8	Semivolatiles - pg 1, TechLaw valid								
	introduction cites DOE/RL-2000-60 I	Praft B. However Rev 1		1000	^~ ~~~	1em			1.
	is in effect and is cited on pg 4		 	1 Car					+
9	wet Chemistry - pg 1, TechLaw valid						-		
	introduction cites DOE/RL-2000-60 I is in effect and is cited on pg 4	Oraft B. However Rev 1		Can	0	1			1
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10	Wet Chemistry - Pg 18, This appears to be the wrong chain of custody, wrong sample number.		con	•	C
11	Wet Chemistry - pg 21, Accuracy checklist item "LCB/BSS samples analyzed?" is unanswered.		carre /=		ے ا

- 1.....

Date:

17 November 2003

To:

Fluor Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

200-PW-2/200-PW-4 OU - Borehole Soil Sampling

Subject: Semivolatile - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 30757 prepared by WSCF. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	С	See note 1

¹⁻Semivolatiles by 8270B; TPH-diesel and TPH-gasoline.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

Holding Times/Sample Preservation

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike sample analyses are used to assess the analytical accuracy of the reported data. Matrix spike/matrix duplicate results are used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged

"UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/matrix spike duplicate and blank spike results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

Due to the lack of a surrogate analysis, all TPH-G results were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

No field duplicate results were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the target quantitation limits (TQL's) to ensure that laboratory detection levels meet the required criteria. The phenol result exceeded the TQL. Under the FHI statement of work, no qualification is required.

Completeness

Data package No. 30757 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a surrogate analysis, all TPH-G results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The phenol result exceeded the TQL. Under the FHI statement of work, no qualification is required

REFERENCES

FHI, Contract #20266, Validation Statement of Work, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the FHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected.

 Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decisionmaking purposes).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
TPH-G	J	All	No surrogate analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Laboratory: WSCF Case:	SDG	WSCF2003	0757	┪			
Sample Number	1000.	B171B9	01 31				
Remarks		BITTES	-	 			
Sample Date		5/30/0	13	+		 	
Analysis Date		6/9/0					
	emivolatile (8270B) TQL				Q	Result	Q
1,2,4-Trichlorobenzene	I GL	Result <1500	Q U	Result	<u> </u>	Kezuit	
1,2-Dichlorobenzene	<u> </u>	<1900	- lü -	 	-		+
1,3-Dichlorobenzene		<1700	Ü	 			+
1,4-Dichlorobenzene		<1600	Ü	 		-	+
2,4,5-Trichlorophenol		<380	U		_	1	
2,4,6-Trichlorophenol		<350	U	+	-	+	\dashv
2,4-Dichlorophenol		<420	Ü	+		 	+
2,4-Dimethylphenol		<350	U	 	_	+	+
2,4-Dinitrophenol		<3500	- 0	+			+
2,4-Dinitrotoluene		<350	-		-		+
2,6-Dinitrotoluene	-	<350	U	+	-	 	
2-Chioronaphthalene		<420	U	 			_
2-Chlorophenol		<760	U	+	-		_
		<930	U		-	 	_
2-Methylnaphthalene 2-Methylphenol		<350	- U	1	-		+
2-Metnyipnenoi 2-Nitroaniline		_	U		1		
		<350	U	<u> </u>			+
2-Nitrophenol		<900					
3 & 4-Methylphenol (total)		<590	U	1			
3,3-Dichlorobenzidine		<420	U	ļ	<u> </u>		\rightarrow
3-Nitroaniline		<350	U				
4,6-Dinitro-2-methylphenol		<3500	U				_ _
4-Bromophenyl-phenyl ether		<350	U				
4-Chloro-3-methylphenol		<350	U	ļ			
4-Chloroanaline		<480	U				
4-Chlorophenyl-phenyl ether		<350	U				
4-Nitroaniline		<1300	U				
-Nitrophenol		<3400	U	1			\bot
cenaphthene		<350	U				
cenaphthylene		<420	U			1	
Anthracene		<350	U				

^{* -} The reported detection limit is above the TQL

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Page__2__ of__3__

Project: FLUOR-HANFORD			1				
Laboratory: WSCF				1			
Case:	SDG: \	VSCF2003	3757	1			
Sample Number		B171B9				T	
Remarks							
Sample Date		5/30/0	3			1	
Analysis Date		6/9/0	3				
Semivolatile (8270B)	TQL	Result	Q	Result	Q	Result	Q
Benzo-a-anthracene	-	<350	U				
Benzo-a-pyrene		<350	U	ļ			
Benzo(b)fluoranthene*		<350	U				_
Benzo(g,h,i)perylene		<350	U				
Benzo(k)fluoranthene*		<350	U	· "			
bis(2-Ethylhexyl)phthalate		<2900	U				
Bis(2-Chloro-1-methylene)		<1300	U				
Butylbenzylphthalate		<350	U				
Carbazole		<420	U		_	1	
Chrysene		<350	U				
Di-n-butylphthalate	Ĭ .	<450	U			1	
Di-n-octylphthalate		<350	U			1	
Dibenz(a,h)anthracene		<350	U				
Dibenzofuran		<350	U				
Diethylphthalate		<1400	U				
Dimethylphthalate		<350	U				
Fluoranthene		<350	U			1	
Fluorene		<350	U				
Hexachlorobenzene		<350	U				
Hexachlorobutadiene		<1900	U				
Hexachlorocyclopentadiene		<1600	υ				
Hexachloroethane		<2400	Ü				
Indeno(1,2,3-cd)pyrene		<350	U				
Isopherone		<350	U	1			
N-Nitroso-di-n-propylamine		<350	U			1 "	
N-Nitrosodiphenylamine		<350	U				
laphthalene		<1500	U				
litrobenzene		<1400	U				
Pentachlorophenol		<1600	Ū				
Phenanthrene		<350	U				
Phenol							
Pyrene		<350	U				

^{* -} The reported detection limit is above the TQL

bis(2-Chloroethly)eth	<250	U		
bis(2-Chloroethoxy)methane	<120	U		

^{* -} The reported detection limit is above the TQL

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Page	4	of	3	
· ugo	7	v.	•	

Project: FLUOR-HANFORD)			1			
Laboratory: WSCF				1			
Case:	30757	1					
Sample Number	B171B9						
Remarks							
Sample Date		5/30/0)3				
ТРН	TQL	Result	Q	Result	Q	Result	Q
Kerosene	5	<16000	U				
TPH-Diesel	5	<16000	U			Ţ-	
TPH-Gasoline	5	<500	UJ				
			l				
	_						

^{* -} The reported detection limit is above the TQL

Attention: Project:

Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

							WSCF								
Sample	e#	Client II)	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W03000	0533	B171B9	GPP TRENT	7439-98-5	Manganese by ICP-MS	SOUD	LA-505-412		139	ug/g	4,73	1.4	06/18/03	05/30/03	06/03/03
W03000	0533	B171B9	GPP TRENT	7439-97-6	Mercury by ICP-MS	SOLID	LA-505-412	,-,.	1.31	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W03000	0533	B171B9	GPP TRENT	7439-98-7	Molybdenum by ICP-MS	SOLID	LA-505-412	U	< 1.42	ug/g	4.73	1.4	06/18/03	05/30/03	06/03/03
M03000	0533	B171B9	GPP TRENT	7440-02-0	Nickel by ICP-MS	SOLID	LA-505-412		5.48	ug/g	4.73	2.4	06/18/03	05/30/03	06/03/03
OOOEOW	0533	B171B9	GPP TRENT	7782-49-2	Selenium by ICP-MS	SOUD	LA-505-412	u	< 1,42	ug/g	4,73	1.4	06/18/03	05/30/03	06/03/03
W03000	0533	B171B9	GPP TRENT	7440-22-4	Silver by ICP-MS	SOLID	LA-505-412	EU	< 0.946	ug/g	4,73	0.95	06/18/03	05/30/03	06/03/03
W03000	0533	B17189	GPP TRENT	7440-28-0	Thallium by ICP-MS	SOLID	LA-505-412	U	< 0.473	ug/g	4.73	0.47	06/18/03	05/30/03	06/03/03
W030000	0533	B17189	GPP TRENT	7440-29-1	Thorium by ICP-MS	SOLID	LA-505-412		3.46	ug/g	4.73	0.95	06/18/03	05/30/03	06/03/03
M03000	0533	817189	GPP TRENT	7440-61-1	Uranium by ICP-MS	SOLID	LA-505-412		28.0	ug/g	4,73	0.47	06/18/03	05/30/03	06/03/03
W030000	0533	B171B9	GPP TRENT	7440-62-2	Vanadium by ICP-MS	SOLID	LA-505-412		45.4	ug/g	4.73	1.9	06/18/03	05/30/03	06/03/03
W03000		817189	GPP TRENT	7440-66-6	Zinc by ICP-MS	SOLID	LA-505-412		25.4	ug/g	4.73	19	06/18/03	05/30/03	06/03/03
W030000		B171B9	GPP TRENT	TPH-G	Total Pet. Hydrocarbons Gas	SOLID	NWTPH	U	< 500	ug/kg	7, 17, 7, 27, 17	5.0e+02	06/12/03	05/30/03	06/03/03
W030000		B171B9	GPP TRENT	12674-11-2	Aracler-1016	SOLID	LA-523-427	u	< 110	ug/kg	1.00	1.1e + 02	06/13/03	05/30/03	06/03/03
₩030000		B171B9	GPP TRENT	11104-28-2	Aroclor-1221	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
		B17189	GPP TRENT	11141-16-5	Aroctor-1232	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e ±02	06/13/03	05/30/03	06/03/03
wo30000		B171B9	GPP TRENT	53469-21-9	Aroclor-1242	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
₩030000		B171B9	GPP TRENT	12672-29-6	Aroctor-1248	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1,10+02	06/13/03	05/30/03	06/03/03
W030000	0533	B171B9	GPP TRENT	11097-69-1	Aroclor-1254	SOLID	LA-523-427	J	140	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
€ M030000	2533	817189	GPP TRENT	11096-82-5	Aroctor-1260	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000	0533	B171B9	GPP TRENT	37324-23-5	Aroclor-1262	SOLID	LA-523-427	Û	< 110	ug/kg	1.00	1.1e+02	06/13/03	05/30/03	06/03/03
W030000	0533	B17189	GPP TRENT	11100-14-4	Aracler-1268	SOLID	LA-523-427	Ü	< 110	ug/kg	1,00	1,1e ≠ 02	06/13/03	05/30/03	06/03/03
W030000	0533	B171B9	GPP TRENT	13981-16-3	Pu-238 by AEA	SOLID	LA-508-471	U	-0.120	pCi/g		0.32	06/17/03	05/30/03	06/03/03
W030000	533	B17189	GPP TRENT	E/T,C	Pu-238 by AEA Total Crity Error	SOLID	LA-508-471		140	%		0.0	06/17/03	05/30/03	06/03/03
W030000	0533	B171B9	GPP TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOLID	LA-508-471		21.0	%		0.0	06/17/03	05/30/03	06/03/03
W030000)533 	8171B9	GPP TRENT	PU-239/240	Pu-239/240 by AEA	SOUD	LA-508-471		3,90	pCi/g		0.077	06/17/03	05/30/03	06/03/03
W030000	533	B171B9	GPP TRENT	120-82-1	1,2,4-Trichlorobenzene	SOLID	LA-523-456	U	< 1.50e + 03	ug/kg	1.00	1.5e+03	06/09/03	05/30/03	06/03/03
W030000	533	B171B9	GPP TRENT	95-50-1	1,2-Dichlorobenzene (SV)	SOLID	LA-523-456	U	< 1,90e+03	ug/kg	1.00	1.9e + 03	06/09/03	05/30/03	06/03/03

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Report W004/ver. 5.1

Ground Water Protection Program

Attention: Project:

Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

						WSCF						
Sample #	Client II)	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample Receiv
W030000533	817189	GPP TRENT	541-73-1	1,3-Dichlorobenzene	SOUD	LA-523-456	U	< 1.70a+03	ug/kg	1.00	1,7e+03	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	106-46-7	1,4-Dichlorobenzene (SV)	SOLID	LA-523-456	U	< 1.60e+03	ug/kg	1.00	1.6e + 03	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	95-95-4	2,4,5-Trichlorophenol	SOLID	LA-523-458	Ü	< 380	ug/kg	1.00	3.8e + 02	06/09/03 05/30/03 06/03/0
W030000533	B17189	GPP TRENT	88-06-2	2,4,8-Trichlorophenol	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/0
W030000533	8171B9	GPP TRENT	120-83-2	2,4-Dichlorophenal	SOLID	LA-523-456	Ü	< 420	ug/kg	1.00	4.2e+02	06/09/03: 05/30/03: 06/03/0
W030000533	8171B9	GPP TRENT	105-67-9	2,4-Dimethylphenol	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/0
W030000533	817189	GPP TRENT	51-28-5	2,4-Dinitrophenol	SOLID	LA-523-456	U	< 3,50e+03	ug/kg	1.00	3.5e+03	. 06/09/03 . 05/30/03 . 06/03/0
W030000533	B171B9	GPP TRENT	121-14-2	2,4-Dinitrotoluene	SOUD	LA-523-456	U	< 350	ug/kg	1.00	3.5e + 02	06/09/03 05/30/03 06/03/0
W030000533	817189	GPP TRENT	606-20-2	2,6 Dinitrotoluane	SOLID	LA-523-456	Ü	< 350	ug/kg	1,00	3.5e+02	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	91-58-7	2-Chloronaphthalene	SOLID	LA-523-456	U	< 420	ug/kg	1.00	4.2+02	06/09/03 05/30/03 06/03/0
WQ30000533	B171B9	GPP TRENT	95-57-8	2: Chlorophenol	SOLID	LA-523-458	U	< 760	ug/kg	1.00	7.6e+02	06/09/03 05/30/03 06/03/0
W03000533	B171B9	GPP TRENT	91-57-6	2-Methylnaphthalene	SOLID	LA-523-456	U	< 930	ug/kg	1.00	9.3e+02	06/09/03 05/30/03 06/03/0
W03000533	817189	GPP TRENT	95-48-7	2-Methylphenol	SOLID	LA-523-456	Ü	< 350	ug/kg	1,00	3,5e+02	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	88-74-4	2-Nitroaniline	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	88-75-5	2-Nitrophenol	SOLID	LA-523-456	Ü	< 900	ug/kg.	1.00	9.0e+02	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	65794-96-9	3 & 4 Methylphenol Total	SOLID	LA-523-458	U	< 590	ug/kg	1.00	5.9a+02	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	91-94-1	3,3'-Dichlerobenzidine	SOLID	LA-523-456	U	< 420	µg/kg	1.00	4.26+02	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	99-09-2	3-Nitroaniline	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/0
yw030000533	B17189	GPP TRENT	534-52-1	4,6-Dinitro-2-methylphenol	SOLID .	LA-523-456	U	< 3,50e+03	ug/kg	1.00	3.5e + 03	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	101-55-3	4-Bromophenyl-phenylether	SOLID	LA-523-456	υ	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	59-50-7	4-Chloro-3-methylphenol	SOLID	LA-523-456	U	< 350	ug/kg	1,00	3,5e + 02	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	106-47-8	4-Chloroaniline	SOLID	LA-523-456	Ų	< 480	ug/kg	1.00	4.8e+02	06/09/03 05/30/03 06/03/0
W030000533	817189	GPP TRENT	7005-72-3	4-Chiorophenyl-phenylether	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	100-01-6	4-Nitroaniline	SOLID	LA-523-456	U	< 1.30e+03	ug/kg	1.00	1.3e+03	06/09/03 05/30/03 06/03/0
W030000533	817189	GPP TRENT	100-02-7	4-Nitrophenol	SOLID	LA-523-456	U	< 3.40e+03	ug/kg	1,00	3.4e ± 03	06/09/03 05/30/03 06/03/0
W030000533	B171B9	GPP TRENT	83-32-9	Acenaphthene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e + 02	06/09/03 05/30/03 06/03/0
W030000533	817189	GPP TRENT	208-96-8	Acenaphthylene	SOLID	LA-523-456	Ü	< 420	ug/kg	1.00	4.2e+02	Q6/09/03 05/30/03 Q6/03/0

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Ground Water Protection Program

J - Estimated Value

Attention: Project: Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

	ojeci.		103-000. 200-1 10	-2/1 11-1		WSCF						
Sample #	Client ID		CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample Receive
W030000533	817189	GPP TRENT	120-12-7	Anthracene:	SOLID	LA-523-456	U	< 350	ug/kg	1,00	3,5e+02	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	56-55-3	Benzo(a)anthracene	SOLID	LA-523-456	Ü	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
WQ30000533	B17189 (GPP TRENT	50-32-8	Benzo(a)pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	D6/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	205-99-2	Benzo(b)fluoranthene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5s+02	06/09/03 05/30/03 06/03/03
W030000533	B17189 (GPP TRENT	191-24-2	Benzolg,h ilperylene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3,5e+02	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	207-08-9	Benzo(k)fluoranthene	SOLID	LA-523-456	Ų	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	117-81-7	Eks (2-Ethylhexyl) phthalate	SOUD	LA-523-456	U	< 2,90s+03	ug/kg	1.00	2.9e+03	06/09/03 05/30/03 06/03/03
W030000533	B171B9	GPP TRENT	108-60-1	Bis(2-Chloro-1-methylene)	SOLID	LA-523-456	U	< 1.30e + 03	ug/kg	1.00	1.3e+03	06/09/03 05/30/03 06/03/03
W03000533	817189	GPP TRENT	85-68-7	Butylbenzylphthalate	SQUD	LA-523-456	Ü	< 350	ug/kg	1,00	3.5e+02	06/09/03 05/30/03 06/03/03
W030000533	B17189	GPP TRENT	86-74-8	Carbazole	SOLID	LA-523-456	U	< 420	ug/kg	1.00	4.2e+02	06/09/03 05/30/03 06/03/03
W030000533	B17189 (GPP TRENT	218-01-9	Chrysene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e +02	06/09/03 05/30/03 06/03/03
W030000533	B171B9	GPP TRENT	84-74-2	Di-n-butylphthalate	SOLID	LA-523-456	ับ	< 450	ug/kg	1.00	4.5e+02	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	117-84-0	Di-n-octylphthalate	SOLID	LA-523-456	U	< 350	ug/kg	1,00	3.5e+02	06/09/03 05/30/03 05/03/03
W030000533	B171B9 (GPP TRENT	53-70-3	Dibenz(a,h)anthracene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e + 02	06/09/03 05/30/03 06/03/03
	B171B9	GPP TRENT	132-64-9	Dibenzofuran	50LID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/03/03 05/30/03 06/03/03
	B171B9 (GPP TRENT	84-66-2	Diethylphthalate	SOLID	LA-523-456	J	1.40e+03	ug/kg	1.00	9.7e+02	06/09/03 05/30/03 06/03/03
OV030000533	B171B9	GPP TRENT	131-11-3	Dimethylphthalate	SOLID	LA-523-456	U	< 350	ug/kg	1,00	3.5e+02	06/09/03 05/30/03 06/03/03
	B171B9	GPP TRENT	206-44-0	Fluoranthene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	86-73-7	Flyorana	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	118-74-1	Hexachlorobenzene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
W030000533	B17189 (GPP TRENT	87-68-3	Hexachlorobutadiene	SOLID	LA-523-456	U	< 1.90a+03	ug/kg	1.00	1,9e+03	06/09/03 05/30/03 05/03/03
W030000533	B171B9 (GPP TRENT	77-47-4	Hexachlorocyclopentadiene	SOLID	LA-523-456	U	< 1.60e+03	ug/kg	1.00	1.6e+03	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	67-72-1	Hexachloroethane	SOLID	LA-523-456	U	< 2.40e+03	ug/kg	1.00	2.4e+03	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	193-39-5	Indeno(1,2,3-cd)pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	78-59-1	isophorone	SOLID	LA-523-456	U	< 350	ug/kg	1,00	3.5e+02	06/09/03 05/30/03 06/03/03
W030000533	B171B9 (GPP TRENT	621-64-7	N-Nitroso-di-n-propylamine	SOLID	LA-523-456	Ų	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
W030000533	B171B9	GPP TRENT	86-30-6	N-Nitrosodiphenylamine	SOLID	LA-523-456	U	< 350	ug/kg	1,00	3.5e+02	06/09/03 05/30/03 06/03/03

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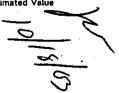
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Report W004/ver. 5.1

Ground Water Protection Program

J - Estimated Value



Attention: Project:

Steve Trent F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

			-		WSCF						
Sample #	Client ID	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample Receive
W030000533	B17189 GPP TRENT	91-20-3	Naphthalene	SOUD	LA-523-456	Ų	< 1.50e+03	ug/kg	1.00	1.5e + 03	06/09/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	98-95-3	Nitrobenzene	SOLID	LA-523-456	U	< 1.40e+03	ug/kg	1.00	1.4e+03	06/09/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	87-86-5	Pentachlorophenol	SOLID	LA-523-456	Ų	< 1,60e+03	ug/kg	1.00	1.6e+03	06/09/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	85-01-8	Phenanthrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
W030000533	817189 GPP TRENT	108-95-2	Phenol	SOUD	LA-523-456	ប	< 520	ug/kg	1,00	5.2e + 02	06/09/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	129-00-0	Pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
WQ30000533	B17189 GPP TRENT	111-44-4	bis(-2-Chloroethyl)Eth	SOLID	LA-523-456	U	< 1,30e+03	up/kg	1.00	1.3e+03	06/09/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	111-91-1	bis(2-Chloroethoxy)methane	SOLID	LA-523-456	U	< 590	ug/kg	1.00	5.9e+02	06/09/03 05/30/03 06/03/03
W030000533	817189 GPP TRENT	13966-29-5	U-234 by AEA	SOLID	LA-508-471		4.70	pCi/g		0,063	06/16/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	U-234 by AEA Total Cntg Error	SOLID	LA-508-471		27.0	%	A. 24.474 ASALAS 7	0.0	06/16/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	15117-96-1	U-235 by AEA	SOLID	LA-508-471	Allen II	0.260	pCi/g		0.069	06/16/03 05/30/03 06/03/03
W030000533	817189 GPP TRENT	E,T,C	U-235 by AEA Total Cntg Error	SOLID	LA-508-471		47.0	%		0.0	06/16/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	24678-82-8	U-238 by AEA	SOUD	LA-508-471		4,70	pCi/g		0.023	06/16/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	U-238 by AEA Total Cntg Error	SOLID	LA-508-471		27.0	%		0.10	06/16/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	71-55-6	1,1,1-Trichloroethane	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	\$	79-00-5	1,1,2-Trichloroethane	SOLID	LA-523-465	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W030000533		75-34-3	1,1-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
_W030000533		75-35-4	1,1-Dichloroethene	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W030000533	AND THE PROPERTY OF THE PROPERTY OF THE PARTY OF THE PART	107-06-2	1,2-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/03/03
CM030000633	##\$#\$#\$#\$#\$###########################	540-59-0	1,2-Dichloroethene (cis & tran	SOLID	LA-523-455	U	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	78-87-5	1,2-Dichloropropane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W030000533	tgaratayasangi biya ilikua kalasantiyaya (kala ilikasan) ilika	78-93-3	2-Butanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W030000533		591-78-6	2-Hexanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W030000533	ani dagaran cerakan nagara	108-10-1	4-Methyl-2-pentanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
the contract analytic traction	and the state of t	67-64-1	Acetone	SOLID	LA-523-455	υ	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	71-43-2	Benzene	SOLIO	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03

MDL=Minimum Detection Limit RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors

U - Analyzed for but not detected above limiting criteria.

J - Estimated Value

DF=Dilution Factor

• - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols Report W004/ver. 5.1 Ground Water Protection Program

Attention: Project:

Steve Trent F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

					WSCF							
Sample #	Client ID	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample	e Receive
W030000532	B171CO GPP TRENT	75-01-4	Vinyl Chiodde	SOLID	LA-523-455	U	< 20.0	ug/kg	1,00	20	08/12/03 05/30/03	06/03/03
W030000532	B171CO GPP TRENT	10061-01-5	cis-1,3-Dichloropropens	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03 05/30/03	06/03/03
W030000532	8171CO GPP TRENT	10061-02-6	trans-1,3-Dichloropropana	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03 05/30/0	3 06/03/03
W030000532	B171CO GPP TRENT	TPHKEROSENE	Kerosene	SOLID	NWTPH	U	< 1.50e+04	ug/kg	1.00	1.5e+04	06/12/03 05/30/03	06/03/03
W030000532	B171CO GPP TRENT	68476-34-6	Total Pet. Hydrocarbons Diesel	SOUD	NWTPH	UT	< 1.50a+04	ug/kg	1,00	1,5e + 04	08/12/03 05/30/03	06/03/03
W030000532	8171CO GPP TRENT	84-15-1	ortho-Terphenyl	SOLID	NWTPH	isisis 👐 i (i	9.10e+04	ug/kg	1.00	2.0e+03	06/12/03 05/30/03	06/03/03
W030000533	817189 GPP TRENT	7664-41-7	Aramonia (N) by IC	SOLID	LA-503-401		253	ug/g	5.00e+00	2 2.0	06/09/03 05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	57-12-5	Cyanide by Midi/Spectrophotom	SOLID	LA-695-402	U	< 0.200	mg/kg		0.20	06/12/03 05/30/03	06/03/03
W030000533	817189 GPP TRENT	TS	Percent Solids	SOUD	LA-519-412		96.2	%		0.0	06/12/03 05/30/0	3 06/03/03
W030000533	B171B9 GPP TRENT	PH	pH Soil and Waste Measurement	SOLID	LA-212-411		8.42	ρН		0.010	06/11/03 05/30/03	3 06/03/03
W030000533	B171B9 GPP TRENT	14596-10-2	Am-241 by AEA	SOLID	LA-508-471		2.00	pCi/q		0.32	06/17/03 05/30/0	06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Am-241 by AEA Total Cntg Error	SOLID	LA-508-471	• • • • • • • •	24.0	%		0.0	06/17/03 05/30/03	3 06/03/03
W030000533	817189 GPP TRENT	24959-67-9	Bromide (Br) by IC	SOUD	LA-533-410	Ų	< 22.5	ug/g	5.00e + 00	2 22	06/10/03: 05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	16887-00-6	Chloride (Cl) by IC	SOLID	LA-533-410		12.4	ug/g	5.00e + 002	2 7.0	06/10/03 05/30/03	06/03/03
W030000533	B17189 GPP TRENT	16984-48-8	Fluoride (F) by IC	SOLID	LA-533-410	U	< 3.50	ug/g	5.00e+002	3.5	06/10/03: 05/30/03	3 : 06/03/03
W030000533	B171B9 GPP TRENT	NO3-N	Nitrate (N) by IC	SOLID	LA-533-410		165	ug/g	5.00e + 002	2 2.5	06/10/03 05/30/03	3 06/03/03
W030000533	াৰত প্ৰকৃতি ব্ৰেপ্ত বিশ্বৰ বিশ্বৰ বিশ্বৰ স্থানীৰ প্ৰতি হয়	NO2-N	Nitrite (N) by IC	SOLID	LA-533-410	Ų	< 4.50	ug/g	5,00e+00	2 4.5	06/10/03 05/30/0	3 06/03/03
[W030000533	B171B9 GPP TRENT	14265-44-2	Phosphate (P) by IC	SOLID	LA-533-410	U	< 6.50	ug/g	5.00e + 002	2 6.5	06/10/03 05/30/03	3 06/03/03
> WD30000533	uniada: niniada: [14808-79-8	Sulfate (SO4) by IC	SOLID	LA-533-410		647	ug/g	5.00e+00	2 12	06/10/03 05/30/0	3 : 06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Ac-228 Ref. % Count Error (GEA)	SOLID	LA-508-462		133	%		0.0	06/13/03 05/30/03	3 06/03/03
W03000533	817189 GPP TRENT	14331-83-0	Ac-228 by GEA	SOLID	LA-508-462	Ü	-18.6	pC/g		41	06/13/03 05/30/0	3 06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Am-241 Rel.% Count Error (GEA)	SOLID	LA-508-462		308	%		0.0	06/13/03 05/30/03	3 06/03/03
	B171B9 GPP TRENT	14596-10-2	Am-241 by GEA	SOLID	LA-508-462	U	-17.8	pÇi/g		92	06/13/03 05/30/0	3 06/03/03
	8171B9 GPP TRENT	E,T,C	Bi-212 Rel.% Count Error (GEA)	SOLID	LA-508-462		887	%		0.0	06/13/03 05/30/0	3 06/03/03
	817189 GPP TRENT	14913-49-6	BI-212 by GEA	SOLID	LA-508-462	U	-7.87	pCi/g		1,2+02	08/13/03 05/30/0	3 D6/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Bi-214 Ref. % Count Error (GEA)	SOLID	LA-508-462		1.00e+03	%		0.0	06/13/03 05/30/0	3 06/03/03
W03000533	B171B9 GPP TRENT	14733-03-0	Bi-214 by GEA	SOLID	LA-508-462	U	1.75	pCI/g		34	06/13/03 05/30/0	3: 06/03/03

MDL=Minimum Detection Limit

E - Analyte is an estimate, has potentially larger errors

RQ=Result Qualifier

U - Analyzed for but not detected above limiting criteria.

J - Estimated Value

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report W004/ver. 5.1

Ground Water Protection Program

Attention: Project: Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

_				•	-	WSCF						
Sample #	Client	ID	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample Receive
W0300005	3 817189	GPP TRENT	75-27-4	Bromodichloromathane	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1,00	21	08/12/03 05/30/03 06/03/03
W0300005	3 B171B9	GPP TRENT	75-25-2	Bromoform	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W0300005	3 617189	GPP TRENT	74-83-9	Bromomethane	SOLID	LA-523-455	u	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W0300005	3 B171B9	GPP TRENT	75-15-0	Carbon Disulfide	SOLID	LA-523-455	U	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/03/03
W0300005	3 817189	GPP TRENT	56-23-6	Carbon Tetrachloride	SOUD	LA-523-455	Ü	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/03/03
W0300005	3 817189	GPP TRENT	108-90-7	Chlorobenzene	SOLID	LA-523-455	ukatatatan i U	< 21.0	ug/kg	1.00	01 50 500 1100 1100 1100 1100 1100 1100	06/12/03 05/30/03 06/03/03
W0300005	3 817189	GPP TRENT	75-00-3	Chloroethane	solio	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W0300005	3 817189	GPP TRENT	67-66-3	Chloroform	SOLID	LA-523-455	U U	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/03/03
W0300005	3 817189	GPP TRENT	74-87-3	Chloromethene	SOUD	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W0300005	3 817189	GPP TRENT	124-48-1	Dibromochloromethane	SOLID	LA-523-455	orani missaassa (k. U	< 21.0	ug/kg	1.00	* Billio Billio 21	06/12/03 05/30/03 06/03/03
W0300005	3 B17189	GPP TRENT	100-41-4	Ethylbenzene	SOLID	LA-523-455	ប	< 21.0	ua/ka	1.00	21	06/12/03 05/30/03 06/03/03
	3 817189	GPP TRENT	75-09-2	Mathylene Chloride	SOLID	LA-523-455	1292 ¹ 7-191 ⁷ 192717	1.60e+03	ug/kg	1,00	21	06/12/03 05/30/03 06/03/03
> wo3oooos:	3 817189	GPP TRENT	100-42-5	Styrene	SOLID	LA-523-455	Ü	< 21,0	ug/kg	1,00	21	06/12/03 05/30/03 06/03/03
→ W0300005:	3 B17189	GPP TRENT	127-18-4	Tetrachloroethene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	3 817189	GPP TRENT	108-88-3	Toluene	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
w0300005:	3 B171B9	GPP TRENT	1330-20-7	Total Xylenes	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	3 817189	GPP TRENT	79-01-6	Trichlaroethene	SOLID	LA-523-455	U	< 21.0	ug/kg	1,00	Nacet 21 in 1	06/12/03 05/30/03 06/03/03
→ wo300005	3 B171B9	GPP TRENT	75-01-4	Vinyl Chlorids	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W0300006	3 817189	GPP TRENT	10061-01-5	cis-1,3-Dichloropropene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W03000053	3 B171B9	GPP TRENT	10061-02-6	trans-1,3-Dichloropropene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
W0300005	3 817189	GPP TRENT	TPHKEROSENE	Kerosene	SOLID	NWTPH	ช	< 1.60e+04	ug/kg	1,00	1.6e + Q4	06/12/03 05/30/03 06/03/03
W03000053	3 817189	GPP TRENT	68476-34-6	Total Pet. Hydrocarbons Diesel	SOLID	NWTPH	U	< 1.60s+04	ug/kg	1.00	1.6e+Q4	06/12/03 05/30/03 06/03/03
W03000053	3 B171B9	GPP TRENT	B4-15-1	ortho-Terphenyl	SOLID	NWTPH		9,60e+04	ug/kg	1.00	2.1e + 03	06/12/03 05/30/03 06/03/03

MDL=Minimum Detection Limit RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors

U - Analyzed for but not detected above limiting criteria.

J - Estimated Value

DF=Dilution Factor

- Indicates results that have NOT been validated;

+ - indicates more than six qualifier symbols

Report W004/ver. 5.1

Ground Water Protection Program



Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	WSCF20030757
Sample Matrix	Soil .
Sample Visual	Brown
SAF Number	F03-006
Data Deliverable	Summary Report

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the Groundwater Protection Program-Letter of Instruction, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.
- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.
- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D - The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale

WSCF Production Control

<u>Abbreviations</u>

Hg - mercury

IC - ion chromatography

ICP - inductively coupled plasma

ICP/AES - ICP/atomic emission spectroscopy

ICP/MS - ICP/mass spectrometry

Total U - total uranium

AT/TB - total alpha/total beta

AEA - Alpha Energy Analysis

WTPH-G - Total Hydrocarbons-Gasoline

Am - americium

Cm - curium

Pu – plutonium

Np - neptunium

GEA – gamma energy analysis

H3 - Tritium

Sr - Strontium 89, 90

WTPH-D - Total Hydrocarbons-Diesel

TSS - Total Suspended Solids

FH-Central Platea	u Project	C	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST F03-006-144								Page I of 1				
Collector Johansen/Pope/Pfister	:	Comp	Company Contact Telephone No. Project Coordinator I.C. Hulstrom 373-3928 TRENT, SJ							Price Code	8N	Data Tur			
Project Designation 200-PW-2/200-PW-4 OU - Bo	orehole Soil Sampling	Sample 216	Sampling Location my 6-24-03 216-B-12 (C3246); (32-35) 30-33-5 (35.5-38) SAF No. F03-006						Air Quality 🗆 60 D			Days ———			
Ice Chest No.			Field Logbook No. COA HNF-N-3361 117504ES10					Method of Shipment Government Vehicle							
Shipped To 250 222-Stab Operations	F 413103		Offsite Property No. B						Bill of Lading/Air Bill No. N/A						
POSSIBLE SAMPLE HAZA	RDS/REMARKS			Cool 4C	Cool 4C	None	Nor								
	-	-	Preservation	aG	· aG	aG	aG					<u> </u>		-	
Special Handling and/or S	torage	-	Type of Container	2	1	1	1						-	 	
			No. of Container(s)	40mL	40mL	7:05-30-03	60m			 -			 	<u> </u>	
7603	30757		Volume	VOA-	<u> </u>	COMIC									
	SAMPLE ANALY	rsis		E260A- Complete	Semi-VOA 8270A (TCI PCBs - 800	L); Special Instructions.	See item Speci Instruc	ial tions.			Tata				
Sample No.	Matrix *	Sample Date	Sample Time	> ' -	STL	-					VILTO				
B17189 W0 50000 533	SOIL	5-34-1									BITIA				
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CHAIN OF POSSESSIO	N :	Sign/Prin	t Names	<u> </u>	lem	ECLA I INCER		ONE						Matrix *	
Relinquished By/Removed From			5777 Ref 5-36	ate/Time 103 (4) ate/Time 13	5 .	The laboratory is	to repor	t both			-		•	S=Soil SE=Sediment SO=Solid	
Pla-64-4277 Kef Relinguished By/Removed From	6/03/03 /3/5 Date/Time /400		me (yes) hon	ate/Time	3/02 Ga 14/50 (A	Gamma Spectro umma Spec - Add- utonium; Americiu untimony, Arsenic	on (Anti m-241; I Barium	imony Isotopi Beryl	-125, Cesium-1 ic Uranium; Tot Ilium, Cadmium	34, Radiu at Uraniu Chromit	m-226, Radium-2 m; ICP Metals - 6 m, Copper, Nick	28, Tin-126); 5010A (SW-84 el. Silver); ICI	Isotopic 6) P Metals -	Si=Sludge W = Water O=Oil A=Air DS=Drum Solids	
Relinquished By/Removed From	Date/Time	Received By/Stor		6/3/63 ate/Time	{C 350	(Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-oa) (Bismuth, Boron, Lead, Selenium); Mercury - 1471 - (CV), 1C Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate); Total Cyanide - 9010; Ammonia - 350.1; pH (Soil) - 9045 (2) Technotium 99; Streatium 89,90 - Sr 90; Isotopie Thorium (Thorium - 237); Neptunium - 237; Iodine - 100 -							DL=Drum Liquid T=Tissue WI=Wipe L=Liquid		
Relinquished By/Removed From	Date/Time	Received By/Stor	ed In D	ate/Time	12	9-	0 1	21	WTP.	ر م				V=Vegetation X=Other	
Relinquished By/Removed From	Date/Time .	Received By/Stor	ed In D		WTPH-D & WTPH-C					mai					
LABORATORY Received By SECTION	· ·			T	itle	· •.							Date/Time	· I	
FINAL SAMPLE Disposal Me DISPOSITION	thod					Dispo	sed By	: :					Date/Time	•	
BHI-EE-011 (03/01/2002)			<u>#</u>	1- 0	00 5	× & 66	2/0	/	,	··-·					

#1-200.8 & 6010 / MAN 06-05-03

Appendix 5

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	В	(c)	D	E
PROJECT: ての	0-PW-2/201	J-PW-Y	DATA PACKAG	E: WSCF200	30757
VALIDATOR:	+11	LAB: WSC	F	DATE: (O)	8/03
CASE:			spg: 30	757	
		ANALYSES	PERFORMED		7
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270	LOH DAG	SW-846 8270 (TCLP)
_					
SAMPLES/MAT	RIX	·····			
BIT	Pai				
<u></u>		 			
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		 			Soil
L					
			CASE NARRATIV		Yes No N/A
			ON (Levels D and	-	
					Yes No N/A
					Yes No N/A
					Yes No N/A
					Yes No N/A
					Yes No N/A
		•	*******************************		
Data Validation I	Procedure for Chem		•		

3. BLANKS (Levels B, C, D, and E)	
Calibration blanks analyzed? (Levels D, E)	Yes No N/A
Calibration blank results acceptable? (Levels D, E)	Yes No (N/A)
Laboratory blanks analyzed?	_
Laboratory blank results acceptable?	\sim
Field/trip blanks analyzed? (Levels C, D, E)	Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E)	Yes No (N/A)
Transcription/calculation errors? (Levels D, E)	
Comments:	
4. ACCURACY (Levels C, D, and E)	ASS
Surrogates/system monitoring compounds analyzed?	No NA
Surrogate/system monitoring compound recoveries acceptable?	Yes No N/A
Surrogates traceable? (Levels D, E)	
Surrogates expired? (Levels D, E)	_
MS/MSD samples analyzed?	
MS/MSD results acceptable?	Ye No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No NA
MS/MSD standards? (Levels D, E)	Yes No (N/A)
LCS/BSS samples analyzed?	
LCS/BSS results acceptable?	Ye No N/A
Standards traceable? (Levels D, E)	
Standards expired? (Levels D, E)	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Performance audit sample(s) analyzed?	Yes No N/A
Performance audit sample results acceptable? Comments: No TPH-G surrogal	
No PAS	
	•

5. PRECISION (Levels C, D, and E)	
MS/MSD samples analyzed?	X T
MS/MSD RPD values acceptable?	
MS/MSD standards NIST traceable? (Levels D, E)	
MS/MSD standards expired? (Levels D, E)	
Field duplicate RPD values acceptable?	Yes No N/A
Field split RPD values acceptable?	
Transcription/calculation errors? (Levels D, E)	Yes No NA
Comments:	
6. SYSTEM PERFORMANCE (Levels D and E)	
Internal standards analyzed?	1/ 1
Iinternal standard areas acceptable?	, ,
Internal standard retention times acceptable?	Yes No N/A
Standards traceable?	Yes No N/A
Standards expired?	Yes No N/A
Transcription/calculation errors?	Yes No N/A
Comments:	
7. HOLDING TIMES (all levels)	
Samples properly preserved?	
Sample holding times acceptable?	Yet No N/A
Comments:	

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION	
Compound identification acceptable? (Levels D, E)	Yes No N/A
Compound quantitation acceptable? (Levels D, E)	Yes No (NA
Results reported for all requested analyses?	Yes No N/A
Rresults supported in the raw data? (Levels D, E)	Yes No N/A
Samples properly prepared? (Levels D, E)	Yes No (N/A
Laboratory properly identified and coded all TIC? (Levels D, E)	Yes No WA
Detection limits meet RDL?	Yes (No N/A
Transcription/calculation errors? (Levels D, E)	
Comments: Phenal over	
9. SAMPLE CLEANUP (Levels D and E)	
9. SAMPLE CLEANUP (Levels D and E) GPC cleanup performed?	Yes No N/A
·	/ 1
GPC cleanup performed?	Yes No N/A
GPC cleanup performed?	Yes No N/A Yes No N/A
GPC cleanup performed? GPC check performed? GPC check recoveries aceptable? GPC calibration performed?	Yes No N/A Yes No N/A Yes No N/A
GPC cleanup performed? GPC check performed? GPC check recoveries aceptable?	Yes No N/A Yes No N/A Yes No N/A Yes No N/A
GPC cleanup performed? GPC check performed? GPC calibration performed? GPC calibration check performed?	Yes No N/A
GPC check performed? GPC check recoveries aceptable? GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable?	Yes No N/A
GPC check performed? GPC check recoveries aceptable? GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable?	Yes No N/A
GPC check performed? GPC check recoveries aceptable? GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired?	Yes No N/A
GPC check performed? GPC check recoveries aceptable? GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired? Analytical batch QC given similar cleanup?	Yes No N/A
GPC check performed? GPC check recoveries aceptable? GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired? Analytical batch QC given similar cleanup? Transcription/Calculation Errors?	Yes No N/A
GPC check performed? GPC check recoveries aceptable? GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired? Analytical batch QC given similar cleanup? Transcription/Calculation Errors?	Yes No N/A
GPC check performed? GPC check recoveries aceptable? GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired? Analytical batch QC given similar cleanup? Transcription/Calculation Errors? Comments:	Yes No N/A

Appendix 6

Additional Documentation Requested by Client

SDG Number: WSCF20030757 SAF Number: F03-006 Sample Date: 05/31/03 Receive Date: 06/03/03 Matrix: SOLID Test: SW-846 8270B Semi-Vols

QC						Analysis	Lower	Upper
Туре	Analyte		CAS#	Results	Units	Date	Limit	Limit
						-	-	
Lab ID:	W03000052	98						
	QC ASSOCIA		SAMPLE					
SUBR	2-Fluorophenol	Surr	387-12-4	85.900	o en la	06/09/03		
SURA	2-Fluorobiphenyl	Surr	321-60-8	92.000	econocconii inter	06/09/03	42.000	105.000
SURA	Nitrobenzene-d5	Surr	4165-60-D	73,600	500 (000 L. 2000	06/09/03	56.000 64.000	122.000
SURA	Phenoi-d5	Surr	4165-62-2	85.900	460000000000000000000000000000000000000	06/09/03	54.000	111.000 120.000
SURR	2,4.6-Tribromopheno	t Sure	118-79-6	73.600	a secondario de	06/09/03	24.000	122.000
SURR	Terphenyl-d14	Surr	98904-43-9	98.200	120.00	06/09/03	35.000	150.000
		_						
Lab ID:	W03000052	-		•				
	QC ASSOCIA		SAMPLE					
SURR	2-Fluorophenol	Surr	367-12-4	71.200	%Recove	06/09/03	42.000	105.000
SURR	2-Fluorobiphanyl	Surr	321-60-8	77.200	%Recove	06/09/03	56.000	122.000
SURR	Nitrobenzene-d5	Surr	4165-60-0	71.200	%Recove	06/09/03	64.000	111.000
SURR	Phenol-d5	Surr	4185-62-2	77.200	%Recove	Page 1000 1000 100 - 1000 1000 1000 1000 10	54.00 0	120.000
SURR	2,4,6-Tribromopheno	11580 - 1. 2111011 - 17 E 11732 HE 1860	118-79-6	59.400	%Recove	Construction and administration of the second	24.000	122.000
SURR	Terphenyl-d14	Surr	98904-43-9	95.600	%Recove	06/09/03	35.000	150,000
Lab ID:	W03000053	0						, ,
	QC ASSOCIA		SAMPLE				•	•
SURFI	2-Fluorophenol	Sun	367-12-4	73,200	%Recove	0 <i>81</i> 09/03	42.000	105.000
SURR	2-Fluorobiphenyl	Surr	321-60-8	73.200	%Recove		56.000	122.000
SURR	Nitrobenzene-d5	Sutr	4165-60-O	67.100	%Recove	ana ang ang ang ang ang ang ang ang ang	64,000	111,000
SURR	Phenol-d5	Surr	4165-82-2	73.200	%Recove	06/09/03	54.000	120.000
SURR	2.4,6-Tribramophenal	Surr	118-79-8	73,200	%Recove	08/09/03	24.000	122.000
SURR	Terphenyl-d14	Surr	98904-43-9	97.600	%Recove	06/09/03	35.000	150.000
T -1- TD-	77102000052	4				•		•
Lab ID:	W03000053		CAMDI E		•			
	QC ASSOCIA							
SURR	2-Fluorophenol 2-Fluorobiphenyl	Suirr	367-12-4	85.300	%Recove	MARKOUL LA PROGRAMMA PROFESSION DE PROFESSION	42.000	105.000
SURR	Nitrobenzene-d5	Surr Surr	321-60-8 4165-60-0	85,300 72,200	%Recove %Recove	, i de de la completa para un substitut de traval de consecuence e	56.000 64.000	122:000 111:000
SURR	******	Surt	4165-62-2		%Recove		54.000	120,000
SURR	2,4,6-Tribromophenol		118-79-8	72.200	%Recove	\$\$\infty\$ \$\infty\$ \$\inf	24.000	122.000
SURR	Terphenyl-d14	Sun	98904-43-9	98.400	%Recove		35.000	150,000
				ningegennt, haadhaat, a shacadh ni kala	660310000000000000000000000000000000000	**************************************		
Lab ID:	W03000053	2		•				
BATCH	QC ASSOCIA	TED WITH						
MS	1,2,4-Trichlorobenzer	18	120-82-1	79,400	% Recov	06/09/03	46,000	107,000
MS	1,4-Dichlorobenzene	(SV)	106-46-7	85.500	% Recov		30.000	96.000
MS	2,4-Dinitratoluene		121-14-2	79.400	% Recov		59.000	106.000
MS	2-Fluorophenol	Surr	387-12-4	85.500	%Recove	a decrease resources and a constitution of	42.000	105.000
MS	Acenaphthede		83-32-9	85,500	% Recov		61,000	118,000
MS	4-Chloro-3-methylphe	not	59-50-7	81.500	% Recov	06/09/03	61.000	106.000

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SDG Number: WSCF20030757

Matrix: SOLID

Test: SW-846 8270B Semi-Vols

SAF Number: F03-006 Sample Date: 05/30/03 Receive Date: 06/03/03

_QC						Analysis	Lower	Upper
Туре	Analyte			Results	Units	Date	Limit	Limit
MS	2-Chlorophenol		95-57-8	81.500	UNI likilis sõõdit sam	06/09/03	66,000	106.000
MS	N-Nitroso-di-n-propylami	occhanoujacci, poschania su	621-64-7	85.500	% Recov		71.000	114.000
MS	2-Fluorobiphenyl St Phenol	ur	321-60-8 108-95-2	85,500	180000 ASSES (15)	06/09/03	56.000	122,000
MS MS	aced-bhabbabbatcaccccoou, hacebbatcaceccusesses	uer	4165-60-0	89.600 73.300	% Recov	AANTON AUGUST COMMERCE CONTRACTOR	42.000	111.000
MS	4-Nitrophenol	ин Сизакты	100-02-7	69.200	%Recove % Recov	7996699866669866888607497566.	64,000	111:000
MS	Pantachiorophanol	8888888949488138111111111111111111111111	87-86-5	65,200	% Recov		32.000 82.000	118.000 114.000
MS	Phenoi-d5 Sur	T	4165-62-2	73.300	%Recove	900 A PS-07865 (8800 A SA 1986) (1)	54.000	120.000
MS	Pyrene		129-00-0	85,500	% Recov	A CO. COORES CONTRACTOR CONTRACTO	66.000	118,000
MS	2,4,6-Tribromophenol	Surr	118-79-6	79.400	%Recove	06/09/03	24.000	122.000
MS	Terphemyl-d14 St	HE	98904-43-9	97,800	%Recove	08/09/03	35.000	150,000
MSD	1,2,4-Trichlorobenzene		120-82-1	85.600	% Recov	06/10/03	46.000	107.000
MSD	1,4-Dichlorobenzene (SV	i	106-46-7	85,800	% Recov	E0\01\80	30,000	98.000
MSD	2,4-Dinitrotoluene	ecorras orașe vasco (1000 a 1000)	121-14-2	73.300	% Recov	06/10/03	59.000	106.000
MSD	2-Fluorophenol Su	rr .	367-12-4	85,600	%Recave	8 102600665 5000000000000000000000000000000	42.000	105.000
MSD	Acenaphthene	anomacatoreenteen (n. 1777 - 178	83-32-9	85.600	% Recav	ut var a vivia va va vanta taanaanaan maan maan ku	61.000	116.000
MSD	4-Chloro-3-methylphenol		59-50-7	81.500	% Recov	**************************************	81,000	106:000
MSD	2-Chlorophenol	32:334:334:335:44:355:55	95-57-8	81.500	% Recov	TOTAL PROOF DESCRIPTION OF THE PROOF	66.000	106.000
MSD MSD	N-Nitroso-di-n-propylamii 2-Fluorobiphenyl Su		621-64-7 321-60-8	85,600 85,600	% Recov %Recove	lad 1. Jacq gaad 8044 gas 38.88 % 9	71,000	114,000
MSD	Phenol	rr 2000	108-95-2	85.600	% Recove	e s. 4. codecessos same i ne a recurso	56.000 42,000	122,000 111,000
MSD	Nitrobenzene-d5 Si	ırr	4165-60-0	85.600	%Recove	1 Cathagailtean 14 1 15 14	64.000	111,000
MSD	4-Mitrophanol	938-008813-88-008-00-00-00-00-00-00-00-00-00-00-00	100-02-7	73.300	% Recov		32,000	118.000
MSD	Pentachiorophanol	Mark McCasacas sasta 1,0%. Jac.	87-86-5	65.200	% Recov		62.000	114.000
MSO	Phenol-d5 Sur	r	4165-82-2	79.500	% Recove	06/10/03	54.000	120,600
MSD	Pyrene		129-00-0	85.600	% Recov	06/10/03	66.000	118.000
MSD	2,4,6-Tribromophenol	Surr	118-79-6	79.500	%Recove	08/10/03	24.000	122.00G
MSD	Terphenyl-d14 Su	rr	98904-43-9		%Recove		35.000	150.000
SPK-RPD	1,2,4-Trichlorobenzene		120-82-1	TO POST (FAIR DESSE PROPER)	90000000000000000000000000000000000000	06/09/03	0.000	20.000
SPK-RPD	1,4-Dichlorobenzene (SV		106-46-7	Anti- and Anti- and Anti-		06/09/03	0.000	20.000
SPK-RPD SPK-RPD	2,4-Dinitrotoluene 2-Fluorophenot Sui	ଅନ୍ୟ ପ୍ରତିକ୍ଷୟ କ୍ରିଲ ପ୍ରତିକ୍ଷୟ କ୍ରିଲ ଅନ୍ତର୍	121-1 4-2 367-1 2-4	7: 99 0 100:117	20000000000000000000000000000000000000	06/09/03 06/09/03	0.000 42.000	20.000 105.000
SPK-RPD	Acenaphthene		83-32-9	artaa ii daaba ee aabaa ahaa		06/09/03	0.000	20.000
SPK-RPD	4-Chloro-3-methylphenol	\$66.45.00\$770007.850063.000 16.61.01.0	59-50-7	200666 833 7798774878641		08/09/03	0.000	20.000
SPK-RPD	2-Chlorophenol	ART 100 AND ALL ARE ALL ARE ARE	95-57-8		Marianes Company	08/09/03	0.000	20,000
SPK-RPD	N-Nitroso-di-n-propylamir	86 (66 (66 (66 (66 (66 (66 (66 (66 (66 (621-84-7	0.117	RPD	06/09/03	0.000	20.000
SPK-RPD	2-Fluorobiphenyl Su	rr .	321-60-8	100,117	%Recove	06/09/03	56.000	122.000
SPK-RPD	Phenol	control print to the control of the	108-95-2	4.566	RPD	06/09/03	0.000	20.000
SPK-RPD	Nitrobenzene-d5 St	ur .	4165-60-0	118,780	%Recove	(00 - 200 , 24, 00 1 000000000000000000000000000000000	64,000	111.000
SPK-RPD	4-Nitrophenol		100-02-7			06/09/03	0.000	20.000
SPK-RPD	Pentachiorophenol		87-86-5	8.60° (mpanimiçase). D.20.	(2001-0-1000000 A, 176-17	06/09/03	0.000	20.000
SPK-RPD	Phenoi-d5 Sur	f Samsonson and garage	4165-62-2	108.458	Acres 1 de la con-	06/09/03	54.000 0.000	120.000 20.000
SPK-RPD	Pyrene		129-00-0	0,117	RPD %Recove	06/09/03	0.000 24.000	122.000
SPK-RPO	e autonomo en el como de actividad de la como de como de la como d	Suir 	118-79-6 98904-43-9	100.126 100.000	% Recove	the second second second second	35.000	150,000
SPK-RPD SURR	Terphanyl-d14 St 2-Fluorophenol Su	5,555,955,955,957,752,000,000,000,000,000	367-12-4	81.400	%Recove	4. 4639-9715-64.1	42.000	105.000
301111	2-11001001101101 00	•	· - ·				•	4

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SDG Number: WSCF20030757

Matrix: SOLID

Test: SW-846 8270B Semi-Vols

SAF Number: F03-006 Sample Date: 05/30/03 Receive Date: 06/03/03

Type	
SURR	
SURR 2,4,8-Tribromophenol Surr 118-79-6 75,100 %Recove 06/09/03 24,000 122,000 SURR Terphenyl-d1/4 Surr 98904-43-9 93,800 %Recove 06/09/03 35,000 150,000	
SURR	
Lab ID: W030000533 BATCH QC ASSOCIATED WITH SAMPLE SURR 2-Fluoroblanol Sur 367-12.4 78.100 %Recove 06/05/03 42.000 105.001 SURR 2-Fluoroblanol Sur 321-50-8 90.100 %Recove 06/05/03 56.000 122.000 SURR Nirobanzene-05 Sur 4165-60-0 64.100 %Recove 06/05/03 84.000 111/000 SURR Phanol-15 Sur 4165-60-0 64.100 %Recove 06/05/03 54.000 111/000 SURR 2-4-5-Tribromoghenol Sur 118-79-6 60.100 %Recove 06/05/03 24.000 122.000 SURR 2-4-5-Tribromoghenol Sur 118-79-6 60.100 %Recove 06/05/03 24.000 122.000 SURR Terphenyl-d14 Surr 98904-43-9 90.100 %Recove 06/05/03 35.000 150.000 BATCH QC BLANK 1,2-Dichlorobanzene (SV) 95-50-1 < 1800 ug/Kg 06/05/03 BLANK 1,2-L-Trichlorobanzene 120-92-1 < 1800 ug/Kg 06/05/03 BLANK 1,4-Dichlorobanzene 151-73-1 < 1800 ug/Kg 06/05/03 BLANK 1,4-Dichlorobanzene 170-93-2 < 400 ug/Kg 06/05/03 BLANK 2,4-Dichlorobanzene 170-93-2 < 400 ug/Kg 06/05/03 BLANK 2,4-Dichlorobanzene 121-14-2 < 330 ug/Kg 06/05/03 BLANK 2,4-Dirhtrotoluene 121-14-2 < 330 ug/Kg 06/05/03 BLANK 2,4-Dirhtrotoluene 121-14-2 < 330 ug/Kg 06/05/03 BLANK 2,4-Dirhtrotoluene 18-88-4 < 370 ug/Kg 06/05/03 BLANK 2,4-Dirhtrotoluene 19-58-5 < 330 ug/Kg 06/05/03 BLANK 2,5-Dirhtrotoluene 19-58-5 < 330 ug/Kg 06/05/03 BLANK 2-Dirhtrotoluene 19-58-5 < 500 ug/Kg 06/05/03 BLANK 2-Nutropathalene 10-58-59-5 Ug/Kg 06/05/03))
BATCH QC ASSOCIATED WITH SAMPLE ## SURR))
SURR 2-Fluorobipheny Surr 321-50-8 90,100 %Recove 06/09/03 56,000 122,000 SURR Nitrobenzene-d5 Surr 4165-62-2 90,100 %Recove 06/09/03 54,000 110,000 SURR Phenol-d5 Surr 4165-62-2 90,100 %Recove 06/09/03 54,000 122,000 SURR 2,4.6-Tribarmophenol Surr 118-79-6 60,100 %Recove 06/09/03 24,000 122,000 SURR Terphenyl-d14 Surr 98904-43-9 90,100 %Recove 06/09/03 24,000 122,000 SURR Terphenyl-d14 Surr 98904-43-9 90,100 %Recove 06/09/03 35,000 150,000 SURR Terphenyl-d14 Surr 98904-43-9 90,100 %Recove 06/09/03 35,000 150,000 SURR Terphenyl-d14 Surr 98904-43-9 90,100 Wg/kg 06/09/03 35,000 150,000 SURR 1,2-4-Trichlorobenzene 120-82-1 < 1500 ug/kg 06/09/03 SURR 1,2-4-Trichlorobenzene 541-73-1 < 1500 ug/kg 06/09/03 SURR 1,3-3-bichlorobenzene 541-73-1 < 1500 ug/kg 06/09/03 SURR 1,4-Dichlorobenzene 541-73-1 < 1500 ug/kg 06/09/03 SURR))
SURR Nitrobenzene-d5 Surr 4165-60.0 84.100 %Recove 06/09/03 84.000 111.000	,
SURR Phenol-d5 Surr 4165-62-2 90,100 %Recove 06/09/03 54,000 120,000	8080 (SSA)888888888888
SURR 2,4,5-Tribromophenol Surr 118-79-6 60.100 %Recove 06/09/03 24,000 122,000 SURR Terphenyl-d14 Surr 98904-43-9 90.100 %Recove 06/09/03 35,000 150.000 SURR Terphenyl-d14 Surr 98904-43-9 90.100 %Recove 06/09/03 35,000 150.000 SURR 1,2-Dichlorobenzene (SV) 95-50-1 < 1800 ug/Kg 06/09/03 SURR 1,2-Dichlorobenzene 120-82-1 < 1500 ug/Kg 06/09/03 SURR 1,3-Dichlorobenzene S41-73-1 < 1600 ug/Kg 06/09/03 SURR 1,4-Dichlorobenzene SV) 106-48-7 < 1600 ug/Kg 06/09/03 SURR 2,4-Dichlorobenzene SV) 106-48-7 < 1600 ug/Kg 06/09/03 SURR 2,4-Dichlorobenzene 121-14-2 < 330 ug/Kg 06/09/03 SURR 2,4-Dichlorobenzene 121-14-2 < 330 ug/Kg 06/09/03 SURR 2,4-Dichlorobenzene 35-98-4 < 370 ug/Kg 06/09/03 SURR S	1
SURR Terphenyl-d14 Surr 98904-43-9 90.100 %Recove 06/09/03 35.000 150.000	Construction and the Construction of the Const
### BATCH QC BLANK	79-00-0000-0000-0000-000-00
BLANK 1,2-Dichtorobenzene ISV 95-50-1 < 1800 ug/Kg 06/09/03	,
BLANK 1,2,4-Trichlorobenzene 120-82-1 < 1500 ug/kg 06/09/03	
BLANK 1,3-Dichlorobenzene 541-73-1 < 1800 ug/Kg 08/09/03	
BLANK 1,4-Dichlorobenzene (SV) 106-48-7 < 1600 ug/Kg 06/09/03	uccijas, iz 16 Magtago
BLANK 2,4-Dichlorophenol 120-83-2 < 400 ug/Kg 06/03/03	
BLANK 2,4-Dinitrotoluene 121-14-2 < 330 ug/Kg 06/09/03 BLANK 2,4,6-Trichlorophenol 95-85-4 < 370	
BEANK 2.4,5-Trichlorophenol 95-85-4 < 370 \(\frac{1}{2}\) \(\frac{1}\) \(\frac{1}{2}\) \(\frac{1}{2	
BLANK 2,4,6-Trichlorophenol 88-08-2 < 330 ug/Kg 06/09/03 BLANK 2,4-Dimethylphenol 105-87-9 < 330	
BLANK 2,6-Dinitrotoluene 606-20-2 < 330 ug/kg 06/09/03 BLANK 2-Butoxyethanol 111-76-2 < 500	
BLANK 2-Butoxyethanol 111-76-2 < 500 ug/Kg 06/09/03 BLANK 2-Chloronaphthalene 91-58-7 < 400	
BLANK 2-Chloronaphthalene 91-58-7 < 400 ug/Kg 06/09/03	
BLANK 2-Fluorophenol Strit 387-12-4 78,000 %Flecovs D6/09/03 42,000 105,000	
BLANK 2-Methylphenol 91-57-6 < 900 ug/Kg 06/09/03 BLANK 2-Methylphenol 95-48-7 < 330 ug/Kg 06/09/03 BLANK 2-Nitrophinol 88-74-4 < 330 ug/Kg 06/09/03 BLANK 2-Nitrophinol 88-75-5 < 870 ug/Kg 06/09/03 BLANK 3 & 4 Methylphenol Total 65794-96-9 < 570 ug/Kg 06/09/03 0.000 300.000	
BLANK 2-Methylphanol 95-48-7 < 330 ug/kg O6/09/03 BLANK 2-Nitroaniline 98-74-4 < 330	
BLANK 2-Nitrophino 88-74-4 < 330 ug/Kg 06/09/03 BLANK 2-Nitrophinol BB-75-5 < 870	
BLANK 3 & 4 Methylphenol Total 65794-96-9 < 570 ug/Kg 06/09/03 0.000 300.000	
BLANK 3-Nitroenillne 99-09-2 < 330 ug/kg 06/09/03	
BLANK 4,6-Dinitro-2-methylphenol 534-52-1 < 3300 ug/Kg 06/09/03 BLANK 4-Bromophenyl-phenylether 101-55-3 < 330 ug/Kg 06/09/03	
BLANK 4-Bromophenyl-phenylether 101:55-3 < 330 ug/Kg 06/09/03: BLANK 4-Chlorophenyl-phenylether 7005-72-3 < 330 ug/Kg 06/09/03	51,34,388,953
D1 X X V	
BLANK Acenaphthylena . 208-96-8 < 400 . ug/Kg 06/09/03	, ভারত হৈ তারিক প্রথমি
BLANK Anthracene 120-12-7 < 330 ug/kg 06/09/03	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
BLANK bis(-2-Chloroethyl)Eth 111-44-4 < 1200 ug/Kg 06/09/03	
BLANK Benzolalanthracene 56-55-3 < 330 ug/Kg 06/09/03	
BLANK Benzo(b)fluoranthene 205-99-2 < 330 ug/kg 06/09/03	
BLANK Benzo(g,h,l)perylene 191-24-2 < 330 ug/Kg 06/09/03 BLANK Benzo(a)pyrene 50-32-8 < 330	

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SDG Number: WSCF20030757

Matrix: SOLID Test: SW-846 8270B Semi-Vols

SAF Number: F03-006

Sample Date: Receive Date:

QC Type	Analyte	CAS#	Results	Units	Analysis Date	Lower Limit	Upper Limit
BLANK	bis(2-Chloraethoxy)methane	111-91-1	< 570	ົບg/Kg	06/09/03		A-1112-4
BLANK	Bis (2-Ethylhexyl) phthalate	117-81-7	< 2800	ug/Kg	06/09/03	* * 1 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000	
BLANK	Bis(2-Chloro-1-methylene)	108-60-1	< 1300	ug/Kg	06/09/03	0.000	10.900
BLANK	Benzo(k)fluoranthens	207-08-9	< 330	ug/Kg	06/09/03		4
BLANK	Butylbenzylphthelete	85-68-7	< 330	ug/Kg	06/09/03		
BLANK BLANK	Carbazole 4-Chioroaniline	86-74-8 106-47-8	< 400 < 470	ug/Kg	06/09/03 06/09/03	- 	
BLANK	4-Chloro-3-methylphenol	59-50-7	< 330	ug/Kg ug/Kg	06/09/03		
BLANK	2-Chlorophenol	95-57-8	< 730	ug/Kg	06/09/03	GROSS SERVICES	
BLANK	Chrysene	218-01-9	< 330	ug/Kg	06/09/03	686666, 64 45, 54 BBB	
BLANK	3,3'-Dichlorobenzidine	91-94-1	< 400	ug/Kg	06/09/03		
BLANK	Dibenz(a,h)anthracene	53-70-3	< 330	ug/Kg	06/09/03		er verseest suit septimises, 1964 upper een een 1965 upper een gegen gegen de 2000 ûnt
BLANK	Dibenzafuran	132-64-9	< 330	ug/Kg	06/09/03		
BLANK	Di-n-butylphthalate	84-74-2	< 430	ug/Kg	06/09/03	**************************************	
BLANK	Diethylphthelate	84-66-2	< 930	ug/Kg	08/09/03		
BLANK BLANK	Dimethylphthalate 2,4-Dinitrophenol	131-11-3 51-28-5	< 330 < 3300	ug/Kg ug/Kg	06/09/03		
BLANK	Di-n-octylphthalate	117-84-0	< 330	ug/Kg	06/09/03		
BLANK	N-Nitroso-di-n-propylamine	621-64-7	< 330	ug/Kg	06/09/03		
BLANK	2-Fluorobiphenyl Surr	321-60-8	90.000	30000000000000000000000000000000000000	06/09/03	56.000	122.000
BLANK	Fligorene	86-73-7	< 330	ug/Kg	06/09/03		
BLANK	Fluoranthena	206-44-0	< 330	ug/Kg	06/09/03		
BLANK	Hexachlorobenzane	118-74-1	< 330	ug/Kg	06/09/03		
BLANK	Hexachlorobutadiene	87-68-3	< 1800	ug/Kg	06/09/03		
BLANK BLANK	Hexachiorocyclopentadiena Hexachioroethane	77-47-4 67-72-1	< 1600 < 2300	ug/Kg	06/09/03		
BLANK	Indeno(1,2,3-sd)pyrene	193-39-5	< 330 · · ·	ug/Kg ug/Kg	06/09/03		
BLANK	Isophorone	78-59-1	< 330	ug/Kg	06/09/03		
BLANK	Phenol	108-95-2	< 500	ug/Kg	06/09/03		
BLANK	Naphthalene	91-20-3	< 1400	ug/Kg	06/09/03		
BLANK	Nitrobenzene-d5 Sur	4165-60-D	84.000 +	%Recove	06/09/03	54:000	111.000
BLANK	Nitrobenzene	98-95-3	< 1300	ug/Kg	06/09/03		v. 1000.000.000.000.000.000.000.000.000.0
BLANK	4-Nitrophenot	100-02-7	< 3200	ug/Kg	06/09/03		
BLANK BLANK	4-Nitroaniline N-Nitrosodiphanylamine	100-01-6 86-30-6	< 1200 < 330	ug/Kg ug/Kg	06/09/03		
BLANK	Pentachiorophenol	87-86-5	< 1500	ug/Kg	06/09/03		
BLANK	Phenanthrene	85-01-8	< 330	ug/Kg	06/09/03		
BLANK	Phenol-d5 Surr	4165-62-2	78.000	%Recove	-550-160050196030056564646464	54.000	120.000
BLANK	Pyrene	129-00-0	< 330	ug/Kg	06/09/03		
BLANK	Tri-n-butylphosphata	126-73-8	< 330	ug/Kg	06/09/03		
BLANK	2,4,6-Tribromophanol Surr	118-79-6	72,000	(06/09/03	24.000	122,000
BLANK	Terphenyl-d14 Surr	98904-43-9	90.000	%Racove		35.000	150.000
ics	1, 2, 4-Trichlorobenzens	120-82-1	84,000	110011100040400000000	06/09/03	46,000	107.000
LCS	1,4-Dichlorobenzene (SV)	108-48-7	90.000 78.000	na na saka katawa na na na	06/09/03 06/09/03	42.000 59.000	111.000 108.000
LCS LCS	2,4-Dinitrotoluene 2-Fluorophenal Surr	121-14-2 367-12-4	78.000 84.000	100000000000000000000000000000000000000	06/09/03	50.000	110.000
LOG	22010piletion out				- · · · · ·		

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SDG Number: WSCF20030757 Matrix: SOLID

Test: SW-846 8270B Semi-Vols

SAF Number: F03-006 Sample Date: Receive Date:

QC					Analysis	Lower	Upper
Туре	Analyte	CAS#	Results	Units	Date	Limit	Limit
ucs	Acenaphthene	83-32-9	90,000	- % Recov	06/09/03	61,000	116.000
LCS	4-Chloro-3-methylphenol	59-50-7	80.000	% Recov	06/09/03	61.000	106.000
LCS	2-Chiarophenai	95-57-8	84,000	% Recov	06/09/03	66.000	108.000
LCS	N-Nitroso-di-n-propylamina	621-64-7	90.000	% Racov	06/09/03	71.000	114.000
LCS	2-Fluorobiphenyl Surr	321-60-8	84,000	% Recov	06/09/03	58,000	109,000
LCS	Phenol	108-95-2	88.000	% Recov	06/09/03	67.000	105.000
LCS	Nitrobenzene-d5 Surr	4165-60-0	78,000	% Recov	08/09/03	60.000	118.000
LCS	4-Nitrophenol	100-02-7	76.000	% Recov	06/09/03	32.000	118,000
LCS	Pentachiorophenol	87-86-5	68,000	% Recov	06/08/03	62.000	114.000
LCS	Phenol-d5 Surr	4165-62-2	78.000	% Recov	06/09/03	59.000	118.000
LCS	Pyrene	129-00-0	84.000	% Recov	06/09/03	66.000	118.000
LCS	2,4,6-Tribromophenol Surr	118-79-6	78.000	% Recov	06/09/03	60.000	120:000
LCS	Terphanyl-d14 Surr	98904-43-9	90.000	% Recov	06/09/03	60,000	120.000

SDG Number: WSCF20030757

Matrix: SOLID

Test: WTPH-D TPH Diesel Range (Wa)

SAF Number: F03-006 Sample Date: 05/31/03 Receive Date: 06/03/03

QC Type	Analyte	CAS#	Results	Units	Analysis Date	Lower Limit	Upper Limit
				•			
Lab ID BATC sura		TED WITH SAMPLE	108.000	% Recov	06/12/03	70.000	130,600
Lab ID BATCI sura		ED WITH SAMPLE	78.000	% Recov	08/12/03	70.000	130.000
Lab ID BATCI surr		ED WITH SAMPLE	99.100	% Recov	06/12/03	70,000	130,000
Lab ID BATCI SURR		ED WITH SAMPLE	94-100	% Recov	06/12/03	70,000	. 130,000
Lab ID BATCI		ED WITH SAMPLE					
MS	ortho-Terpheny)	84-15-1	» 91.000	% Recov	06/12/03	70.000	130.000
MS	Total Pet. Hydrocarbons	AND ACTION OF THE PERSON OF TH	120.000		06/12/03	75.000	125.000
MSD	ortho-Terphenyl	84-15-1	114.000		06/12/03	70.000	130.000
MSD	Total Pet. Hydrocarbons		113.000		06/12/03	75.000	125.000
SPK-RPD	omho-Terphenyl	84-15-1 Diesel 68476-34-6	22.439	7.5	06/12/03	0.000	20,000
SURR	Total Pet. Hydrocarbons ortho-Terphenyt	84-15-1	6.009 90.800	RPD % Recov	06/12/03 06/12/03	0.000 70,000	20,000 130, 0 00
Lab ID BATCI SURB	I QC ASSOCIAT	ED WITH SAMPLE	:::::::::::::::::::::::::::::::::::::	1 318800	0e03002	76.000	
SURM	ortno-Terpnenyi	84-10-1	92.900	76 Mecov	06/12/03	70.000	130,000
BATCE	I QC						
BLANK	Kerosene	TPHKEROSEN	E < 15	ug/Kg	06/12/03	0,000	100.000
BLANK	artho-Terphenyl	84-15-1	0.00		06/12/03	70,000	130,000 / 1
BLANK	Total Pet. Hydrocarbons	and the second s	< 15	ug/Kg	06/12/03	0,000	300.000
LCS LCS	ortho-Terphenyl Total Pet. Hydrocarbons	84-15-1 Diesel 68476-34-6	99.900	Art 200 (4.17)	06/12/03 06/12/03	70.000 80.000	130:000 120.000

SDG Number: WSCF20030757

Matrix: SOLID

Test: NWTPH-GX TPH Gasoline Range

SAF Number: F03-006

Sample Date: 05/ Receive Date: 06/

05/30/03

QC
Type Analyte CAS # Results

Analysis Units Date Lower Limit Upper Limit

Lab ID: W030000532

BATCH OC ASSOCIATED WITH SAMPLE

	2111	Q			~~	** ^4 ***** ***	•					
9- 14 4	DUP	Total	Pet. Hy	drocarbona	Gas	TPH-G	n/a	RPD	06/12/03	giva gar	0.000	20,000
	MS	Total	Pet. Hy	drocarbons	Gas	TPH-G	94.000	% Recov	06/12/03		50.000	150.000
	MSD	Total	Pet Hy	enodresonb	Gas	TPH-G	106.000	% Recov	06/12/03		50:000	150,000
-00	SPK-RPD	Total	Pat. Hy	drocarbons	Gas	TPH-G	12.000	RPD	06/12/03		0.000	20.000
								٠				
	BATC	H QC										•
	BLANK	Total	Pet. Hy	drocarbons	Gas	TPH-G	< 50	mg/L	06/12/03	11,24	0.000	300,000
	LCS	and the second	Transport also also to	drocarbons		TPH-G	107.000	% Recov	06/12/03		85.000	115.000

Date:

17 November 2003

To:

Fluor Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

200-PW-2/200-PW-4 OU - Borehole Soil Sampling

Subject: Radiochemistry - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. 30459 which was prepared by WSCF. A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	С	See note 1 & 2

- 1 Gamma spectroscopy and alpha spectroscopy.
- 2 Gamma spectroscopy results for sample B16W99 were re-analyzed and reported separately in data package WSCF20031181. It is the re-analysis data that was validated and is contained in this report.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client



DATA QUALITY OBJECTIVES

Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

Laboratory (Method) Blanks

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the required detection limit (RDL), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the minimum detectable activity (MDA) are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

Accuracy

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is 80-120%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

All accuracy results were acceptable.

Precision

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection limit (CRDL) and the RPD is less than \pm 1-35 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or

equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPDs outside QC limits, bismuth-214 (60.5%), lead-214 (48.1%), radium-226 (60.5%) and thallium-208 (44.8%) results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

No field duplicate results were submitted for analysis.

Detection Levels

Reported analytical detection levels are compared against the target quanitiation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. Two analytes were reported above the TQL. Under the FHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific TQL.

Completeness

Data package SDG No. 30757 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an RPDs outside QC limits, all bismuth-214 (60.5%), lead-214 (48.1%), radium-226 (60.5%) and thallium-208 (44.8%) results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

000003

Two analytes were reported above the TQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, Validation Statement of Work, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the FHI statement of work are as follows:

- Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2
Summary of Data Qualification

RADIOCHEMICAL DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bismuth-214 Lead-214 Radium-226 Thallium-208	J	All	RPD

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Laboratory: EB				1			
Case	SDG:	WSCF20030	0767	,			
Sample Number		B171B9				T	
Remarks						1	
Location						†	
Sample Date		5/30/03				 	
Radlochemistry	TQL	Result	Q	Result	Τq	Result	Ta
Americium-241	1	2.00	† <u> </u>		+-		Ŧ
Plutonium-238	1	-0.120				 	十
Plutonium-239/240	 	3.90	Ť		╅	†	┪
Uranium-234	1	4.70	<u> </u>		+		\top
Uranium-235	1	0.260	-	<u> </u>	-	 	\top
Uranium-238	1	4.70	_	<u> </u>	\top	t-	+
Cobalt-60	0.06				\top	 	\top
Antimony-125	T	-20.9	-		1	 	┪~
Cesium-134		-2.33	Ū		\top	 	┪-
Ceslum-137	0.1	61900			1		+
Europlum 162	0.1	-20.2		_			十
Europium 164	0.1	-3,16	-	·	1	 	十
Europium 165	0.1	34.9	Г		\top		\top
Tin-126		10.4	υ		1		T
Radium-228*	0.2	2.23	υ			1	7
Radium-226*	0.1	7.12	3		1		\top
Zinc-65		6.25	J				十
Niobium-94		0.916	IJ		7	1	7
Ru-103		-2.03	U				
Ru-106		-16.1	U		T		Т
Tin-113		6.99	U				1
Cerlum-144		49.2	υ				\top
Thallium-208		2.95	5				Τ
Bismuth-212		-6.32	U		\mathbf{I}^{-}		T
Lead-212		15.5	U				Т
Bismuth-214		7.12	IJ				丁
Lead-214		-8.19	ŲJ.				
Actinium-228		2.23	U		1		Т
Thorium-234		148	U				Т
Uranium-235		65.4	C			T	Т
Americium-241		-44.6	C		1		Τ

^{* -} TDL exceeded
Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

Attention: Project:

Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

					WSCF								
Sample#	Client ID	CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000532	B171CO GPP TRENT	75-01-4	Vinyl Chlaride	SOLID	LA-523-455	U	< 20,0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171CO GPP TRENT	10061-01-5	cis-1,3-Dichloropropene	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171CO GPP TRENT	10061-02-6	trans-1,3-Dichloropropane	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03	05/30/03	06/03/03
W030000532	B171CO GPP TRENT	TPHKEROSENE	Kerosene	SOLID	NWTPH	U	< 1.50a+04	ug/kg	1.00	1.5e+04	06/12/03	05/30/03	06/03/03
W030000532	8171CO GPP TRENT	68476-34-6	Total Pet: Hydrocarbons Diesel	SOLED	NWTPH	Ü	< 1.50e+04	ug/kg	1,00	1.5e+04	08/12/03	05/30/03	06/03/03
W030000532	B171CO GPP TRENT	84-15-1	ortho-Terphenyl	SOLID	NWTPH	tevete in tit tit tid	9,10e+04	ug/kg	1.00	2.0e+03	06/12/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	7664-41-7	Ammonia (N) by IC	SOLID	LA-503-401		253	ug/g	5.00e+002	2,0	06/09/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	57-12-5	Cyanide by Midi/Spectrophotom	SOLID	LA-695-402	Ü	< 0.200	mg/kg		0.20	06/12/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	rs :	Percent Solids	SOLID	LA-519-412		96.2	%		0.0	06/12/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	PH	pH Soil and Waste Measurement	SOLID	LA-212-411		8.42	рΗ	itatangtatana kabangni nab	0.010	06/11/03	05/30/03	06/03/03
► W¢30000533	B17189 GPP TRENT	14596-10-2	Am-241 by AEA	SOLID	LA-508-471		2.00	pCI/g		0.32	06/17/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Am-241 by AEA Total Cntg Error	SOLID	LA-508-471		24.0	%	,.,.,	0.0	06/17/03	05/30/03	08/03/03
W030000533		24959-67-9	Bromide (Br) by IC	SOLID	LA-533-410	Ų ·	< 22.5	ug/g	5,00e+002	22	06/10/03	05/30/03	06/03/03
_w030000533	B171B9 GPP TRENT	16887-00-6	Chloride (CI) by IC	SOLID	LA-533-410	• • •	12.4	ug/g	5.00e + 002	7.0	06/10/03	05/30/03	06/03/03
-wosooossa	B171B9 GPP TRENT	16984-48-8	Fluoride (F) by IC	SOLID	LA-533-410	U	< 3.50	ug/g	5.00e+002	3.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	NO3-N	Nitrate (N) by IC	SOLID	LA-533-410		165	ug/g	5.00e + 002	2.5	06/10/03	05/30/03	06/03/03
_w030000533	B171B9 GPP TRENT	NO2-N	Nitrite (N) by IC	SOUD	LA-533-410	Ü	< 4.50	ug/g	5,00e+002	4.5	06/10/03	05/30/03	06/03/03
w030000533		14265-44-2	Phosphate (P) by IC	SOUD	LA-533-410	U	< .6.50	ug/g	5.00e+002	6.5	06/10/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	14808-79-8	Sulfate (\$04) by IC	SOLID	LA-533-410		647	ug/g	5.00e+002	12	06/10/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Ac-228 Rel.% Count Error (GEA)	SOLID	LA-508-462		133	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	of Carabababababababbabbabbabbabbabbabbabbab	14331-83-0	At-228 by GEA	SOLID	LA-508-462	Ü .	-18.6	pCi/g		41	06/13/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Am-241 Rel.% Count Error (GEA)	SOLID	LA-508-462		308	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	14596-10-2	Am-241 by GEA	SOLID	LA-508-462	U	-17.8	pCi/g		92	06/13/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Bi-212 Rei.% Count Error (GEA)	SOLID	LA-508-462		887	%		0.0	06/13/03	05/30/03	06/03/03
W030000533	817189 GPP TRENT	14913-49-6	Bi-212 by GEA	SOLID	tA-508-462	ט	-7.87	pCi/g		1,20+02	06/13/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Bi-214 Rel.% Count Error (GEA)	SOLID	LA-508-462	and the second second	1.00e+03	%	everyone the service of the service	0.0	06/13/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	14733-03-0	Bi-214 by GEA	SOLID	LA-508-462	U .	-1.75	ρÇi/g		34	06/13/03	05/30/03	06/03/03

MDL=Minimum Detection Limit RQ=Result Qualifier

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J - Estimated Value



* - Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

Report W004/ver. 5.1



Attention: Project:

Steve Trent F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

					WSCF						
Sample #	Client ID	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample Receive
W0300005	33 B171B9 GPP TRENT	7439-96-5	Manganese by ICP-MS	SOLID	LA-505-412		139	ug/g	4.73	1.4	06/18/03 05/30/03 06/03/03
W0300005	33 B171B9 GPP TRENT	7439-97-6	Mercury by ICP-MS	SOLID	LA-505-412	ranadan di didagan	1.31	ug/g	4.73	0.47	06/18/03 05/30/03 06/03/03
W0300005	33 B171B9 GPP TRENT	7439-98-7	Molybdenum by ICP-MS	SOLID	LA-505-412	Ú	< 1.42	ug/g	4.73	1.4	06/18/03 05/30/03 06/03/03
W0300005	33 B171B9 GPP THENT	7440-02-0	Nickel by ICP-MS	SOLID	LA-505-412	.*1 2-1*11-1-1-1	5.48	ug/g	4.73	2.4	06/18/03 05/30/03 06/03/03
W0300005	33 B171B9 GPP TRENT	7782-49-2	Selenium by ICP-MS	SOLID	LA-505-412	U	< 1,42	ug/g	4.73	1.4	06/18/03 05/30/03 06/03/03
W0300005	33 B171B9 GPP TRENT	7440-22-4	Silver by ICP-MS	SOLID	LA-505-412	EU	< 0.946	ug/g	4.73	0.95	06/18/03 05/30/03 06/03/03
W0300005	33 B17189 GPP TRENT	7440-28-0	Thallium by ICP-MS	\$OLID	LA-505-412	Ú	< 0.473	ug/g	4 73	0.47	06/18/03 05/30/03 06/03/03
W0300005	33 B171B9 GPP TRENT	7440-29-1	Thorium by ICP-MS	SOLID	LA-505-412	.*.*	3.46	ug/g	4.73	0.95	06/18/03 05/30/03 08/03/03
W0300005	33 B171B9 GPP TRENT	7440-61-1	Uraniem by ICP-MS	SOLID	LA-505-412		28.0	ug/g	4,73	0.47	06/18/03 05/30/03 06/03/03
W0300005	33 B171B9 GPP TRENT	7440-62-2	Vanadium by ICP-MS	SOLID	LA-505-412		45.4	ug/g	4.73	1.9	06/18/03 05/30/03 06/03/03
W0300005	33 B171B9 GPP TRENT	7440-66-6	Zinc by ICP-MS	SOLID	LA-505-412		25.4	ug/g	4.73	19	06/18/03 05/30/03 06/03/03
W03000053	33 B171B9 GPP TRENT	TPH-G	Total Pet. Hydrocarbons Gas	SOLID	NWTPH	U	< 500	ug/kg	100 100 100 100 1000	5.0e+02	06/12/03 05/30/03 06/03/03
W03000053	33 8171B9 GPP TRENT	12674-11-2	Arocler-1016	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03 06/03/03
W 03000053	33 B17189 GPP TRENT	11104-28-2	Aroclor-1221	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03 06/03/03
X0300005 3	3 817189 GPP TRENT	11141-16-5	Aroclor-1232	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1#+02	06/13/03 05/30/03 06/03/03
W03000053	The state of the s	53469-21-9	Arocior-1242	SOLID	LA-523-427	บ	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03 06/03/03
X 03000053		12672-29-6	Aroctor-1248	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03 06/03/03
W03000053	tatara any ara-ara-ara-ara-ara-ara-ara-ara-ara-ara	11097-69-1	Araclor-1254	SOLID	LA-523-427	J	140	ug/kg	1.00	1.1e+02	06/13/03 05/30/03 06/03/03
W03000053		11096-82-5	Aroclor-1260	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.19+02	06/13/03 05/30/03 06/03/03
W03000053	and the state of the state of the control of the state of	37324-23-5	Arodor-1262	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1a+02	06/13/03 05/30/03 06/03/03
W03000053		11100-14-4	Araclor-1268	SOLID	LA-523-427	Sec. (1986-49)	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03 06/03/03
W03000053	Control of the first of the control of the first of the control of	13981-16-3	Pu-238 by AEA	SOLID	LA-508-471	U	-0.120	pCi/g		0.32	06/17/03 05/30/03 06/03/03
W03000053		E,T,C	Pu-238 by AEA Total Cittle Error	SOLID	LA-508-471		140	%		0.0	06/17/03 05/30/03 06/03/03
W03000053	3 B171B9 GPP TRENT	E.T.C	Pu-239/240 AEA Total Cntg Err	SOLID	LA-508-471		21.0	%		0.0	06/17/03 05/30/03 08/03/03
W03000053	ranana katan daga tabah anana menang menangkan berarah ang alikan ang atawa sa panggaran pengangan berarah sa	PU-239/240	Pu-239/240 by AEA	SOUD	LA-508-471		3.90	pCi/g		0,077	06/17/03 05/30/03 06/03/03
W03000053		120-82-1	1,2,4-Trichlorobenzene	SOLID	LA-523-456	U	< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03 05/30/03 06/03/03
W03000053	3 B17189 GPP TRENT	95-50-1	1,2-Dichlarobenzene (SV)	SOLID	LA-523-456	ט	< 1.90e+03	ug/kg	3.00	1.9e+03	06/09/03 05/30/03 06/03/03

MDL = Minimum Detection Limit

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RQ=Result Qualifier

U - Analyzed for but not detected above limiting criteria.

J - Estimated Value



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Report W004/ver. 5.1



Attention: Project:

Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

					WSCF								
Sample #	Client ID	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W030000533	B17189 GPP TRENT	91-20-3	Naphthalene	SOUD	LA-523-456	Ü	< 1.50e+03	ug/kg	1.00	1,5e + 03	06/09/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	98-95-3	Nitrobenzene	SOLID	LA-523-456	U	< 1.40e+03	ug/kg	1.00	1.4e+03	06/09/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	87-86-5	Pentachlorophenol	SOLID	LA-523-458	Ü	< 1.60e+03	ug/kg	1.00	1.6e+03	06/09/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	85-01-8	Phenanthrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	108-95-2	Prienal	SOLID	LA-523-456	U	< 520	ug/kg	1.00	5,2e+02	06/09/03	05/30/03	08/03/03
W030000533	B171B9 GPP TRENT	129-00-0	Pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	111-44-4	bis(-2-Chiloroethyl)Eth	SOLID	LA-523-456	Ü	< 1.30e+03	ug/kg	1.00	1.3e + 03	06/09/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	111-91-1	bis(2-Chloroethoxy)methane	SOLID	LA-523-456	Ų	< 590	ug/kg	1.00	5.9e+02	06/09/03	05/30/03	06/03/03
- W030000533	817189 GPP TRENT	13966-29-5	U-234 by AEA	SQLID	LA-508-471		4.70	pCI/g		0.063	06/16/03	05/30/03	08/03/03
W030000533	B171B9 GPP TRENT	E,T,C	U-234 by AEA Total Cntg Error	SOLID	LA-508-471	101040104 407 4 7 7	27.0	%	58,818 -58,8 2 75121	0.0	06/16/03	05/30/03	06/03/03
- W030000533	B17189 GPP TRENT	15117-96-1	U-235 by AEA	SOLID	LA-508-471		0,260	pCi/g		0.069	06/16/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	U-235 by AEA Total Cntg Error	SOLID	LA-508-471	Thirthian April 1	47.0	%	an da institut	0.0	06/16/03	05/30/03	06/03/03
- W030000533	817189 GPP TRENT	24678-82-8	U-238 by AEA	SOLID	LA-508-471		4,70	pÇi/g		0.023	06/16/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	U-238 by AEA Total Cntg Error	SOLID	LA-508-471	***	27.0	%		0.10	06/16/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	71-55-6	1.1,1-Trichloroethane	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	79.00-5	1,1,2-Triebloroethana	SOLID	LA-523-465	Ü	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	75-34-3	1,1-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	75-35-4	1,1-Dichloroethene	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	107-06-2	1,2-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	817189 GPP TRENT	540-59-0	1,2-Dichloroethene (cis & tran	SOLID	LA-523-455	U .	< 21.0	ug/kg	1,00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	78-87-5	1,2-Dichloropropane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B17189 GPP TRENT	78-93-3	2-Butanone	SOLID	LA-523-455	Ŭ	< 21.0	. ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	591-78-6	2-Hexanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	817189 GPP TRENT	108-10-1	4-Mathyl-2-pentanone	SOLID	LA-523-455	: u	< 21,0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	67-64-1	Acetone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03	05/30/03	06/03/03
W030000533	B171B9 GPP TRENT	71-43-2	Benzene	SOLID	LA-523-455	U	c 21.0	ug/kg	1.00	21	D6/12/03	05/30/03	06/03/03
			and the second s	**************		runumamana akuku aka		(3-2-1-242)(2424)(424	14 - 4140 2424245454545		. * . * . * . * . * . * . * . * . * . *	Anne debeneral	Annual Control

MDL=Minimum Detection Limit E - Analyte is an estimate, has potentially larger errors RQ=Result Qualifier

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Report W004/ver. 5.1



Attention: Project:

Steve Trent F03-006: 200-PW-2/PW-4

Group #:

WSCF20031183

					WSCF							
Sample #	Client ID	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL .	Analyze Sample	Receive
W030000753	B16WB2 DUP 20030642	15092-94-1	Lead-212	SOIL	LA-508-462		0.511	pCi/g	1,00	0.021	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Pb-212 Rel. Count Error (GEA)	SOIL	LA-508-462	· · · · · · · · · · · · · · · · · · ·	- 0.0511	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	14733-03-0	Bismuth-214	SOIL	LA-508-462		0.372	ρCi/g	1.00	0.021	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Bi-214 Rel. Count Error (GEA)	SOIL	LA-508-462	. 1.11 (2118) (1) 	- 0.0547	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000753	B16W82 DUP 20030642	15067-28-4	Lead-214	SOIL	LA-508-462		0.430	pCi/g	1.00	0.022	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Pb-214 Rel. Count Error (GEA)	SOIL	LA-508-462	1 14 1 1000 100 1	- 0.0482	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	14331-83-0	Actinium-228	SOIL	LA-508-462	1	0.524	pCi/g	1.00	0.037	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Ac-228 Rel. Count Error (GEA)	SOIL	LA-508-462		0.0770	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000753	816WB2 DUP 20030642	15065-10-8	Thorium-234	SOIL	LA-508-462	U	0.481	pCi/g	1.00	0.71	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	Th-234 Rel. Count Error (GEA)	SOIL	LA-508-462	945) 1 - 14 - 1 - 4	- 0.232	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	15117-96-1	Uranium-235	SOIL	LA-508-462	Ü	0.0511	pCi/g	1.00	0.086	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E,T,C	U-235 Rel. Count Error (GEA)	SOIL	LA-508-462	disk in 1. -	0.0191	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	14596-10-2	: Americium-241	SOIL	LA-508-462	U	0.0157	pCi/g	1.00	0.086	09/09/03 n/a	08/27/03
W030000753	B16WB2 DUP 20030642	E.T,C	Am-241 Rel Count Error (GEA)	SOIL	LA-508-462	:	- 0.0491	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	10198-40-0	Cobalt-60	SOIL	LA-508-462	U .	-0:188	pCi/g	1.00	4.8	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Co-60 Rel. Count Error (GEA)	SOIL	LA-508-462	1416-91" 	- 1.88	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	14234-35-6	Antimony-125	SOIL :	LA-508-462	U	-20.9	pCi/g	1.00	71	09/09/03 n/a	08/27/03
V030000754	B171B9 DUP 20030757	E,T,C	Sb-125 Rel. Count Error (GEA)	SOIL	LA-508-462	+	- 43.9	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
V030000754	B171B9 DUP 20030757	13967-70-9	Cesium-134	SOIL	LA-508-462	U	-2.33	pCi/g	1.00	14	09/09/03 n/a	08/27/03
Dv030000754	B171B9 DUP 20030757	E,T,C	Cs-134 Rel. Count Error (GEA)	SOIL	LA-508-462	n Pantakasi. •	8.67	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
Dv030000754	B171B9 DUP 20030757	10045-97-3	Cesium-137	SOIL	LA-508-462	illi or	6.19e+04	pCi/g	1.00	22	09/09/03 n/a	08/27/03
×030000754	B171B9 DUP 20030757	E,T,C	Cs-137 Rel. Count Error (GEA)	SOIL	LA-508-462	lafafa na uka ili +	- 7.92e+03	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
030000754	B171B9 DUP 20030757	14683-23-9	Europium-152	SOIL :	LA-508-462	U	-20.2	pCi/g	1.00	62	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Eu-152 Rel. Count Error (GEA)	SOIL	LA-508-462	+	38.0	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B17189 DUP 20030757	15585-10-1	Europium-154	SOIL	LA-508-462	Ü	-3.16	pCi/g	1.00	25	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Eu-154 Rel. Count Error (GEA)	SOIL	LA-508-462	HH-15 4.		pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	14391-16-3	Europium-155	SOIL	LA-508-462		34.9	pCi/g	1.00	55	09/09/03 n/a	08/27/03

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RQ=Result Qualifier

DF=Dilution Factor

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Report WGPP/ver. 1



Attention: Project:

Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20031183

							WSCF							
Sample #	Client II) _		CAS #	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample	Receive
W030000754	B171B9	DUP	20030757	E.T.C	Eu-155 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 33.7	pCi/g	1,00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	15832-50-5	Tin-126	SOIL	LA-508-462	U	10.4	pCi/g	1.00	11	09/09/03 n/a	08/27/03
W030000754	B17189	DUP	20030757	E,T,C	Sn-126 Rel, Count Error (GEA)	\$OIL	LA-508-462		+- 22.3	pÇi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	15262-20-1	Radium-228	SOIL	LA-508-462	U	2.23	pCi/g	1.00	39	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	E.T.C	Ra-228 Rel. Count Error (GEA)	SOIL	LA-508-462	150	+- 22.3	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	13982-63-3	Radium-226	SOIL	LA-508-462	U	7.12 🕥	pCi/g	1.00	32	09/09/03 n/a	08/27/03
W03000754	B17189	DUP	20030757	E,T,C	Ra-226 Rel. Count Error (GEA)	SOIL	LA-508-462	e titt.	+- 194	pCi/g	1.00	0,0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	13982-39-3	Zinc-65	SOIL	LA-508-462	U	6.25	pCi/g	1.00	20	09/09/03 n/a	08/27/03
W030000754	817189	DUP	20030757	E,T,C	Zn-85 Ref. Count Error (GEA)	SOIL	LA-508-462	1400	+- 12.1	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B17189	DUP	20030757	14681-63-1	Niobium-94	SOIL	LA-508-462	U	0.916	pCi/g	1 00	14	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Nb-94 Rel. Count Error (GEA)	SOIL	LA-508-462	1.7 _{1.7} .	+- 8.25	ρCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	13968-53-1	Ruthenium-103	SOIL	LA-508-462	U	-2.03	pCi/g	1.00	24	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Ru-103 Rel. Count Error (GEA)	SOIL	LA-508-462	A Letter	+ 14.6	pCi/g	1.00	0.0	.09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	13967-48-1	Ruthenium-106	SOIL	LA-508-462	U	-16.1	pCi/g	1.00	1.5e+02	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Ru-106 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 91.8	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	13966-06-8	Tin-113	SOIL	LA-508-462	U	6.99	oCi/g	1.00	30	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Sn-113 Rel. Count Error (GEA)	SOIL	LA-508-462	25.2	+- 18.2	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	14762-78-8	Cerium-144	SOIL	LA-508-462	U	49.2	pCi/g	1.00	1.1e+02	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Ce-144 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 65.4	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	14913-50-9	Thallium-208	SOIL	LA-508-462	U	2.95 🗍	pCi/g	1.00	18	09/09/03 n/a	08/27/03
W030000754	B17189	DUP	20030757	E,T,C	TI-208 Rel. Count Error (GEA)	SOIL	LA-508-462		+- 10.5	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	14913-49-6	Bismuth-212	SOIL	LA-508-462	U	-6.32	pCi/g	1.00	1,1s+02	09/09/03 n/a	08/27/03
_1 t 5 7 195 7 (F)F) 6 (6	B17189	DUP	20030757	E,T,C	Bi-212 Rel: Count Error (GEA)	SOIL	LA-508-462		+- 63.2	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
V030000754	B171B9	DUP	20030757	15092-94-1	Lead-212	SOIL	LA-508-462	Ü	15.5	pCi/g	1.00	34	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	Pb-212 Ref. Count Error (GEA)	SÖIL	LA-508-462		. +- 20.8	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	14733-03-0	Bismuth-214	SOIL	LA-508-462	U	7.12 🕽	pCi/g	1.00	32	09/09/03 n/a	08/27/03
W030000754	B171B9	DUP	20030757	E,T,C	8i-214 Rel. Count Error (GEA)	SOIL	LA-508-462		4- 19.4	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03

MDL=Minimum Detection Limit

U - Analyzed for but not detected above limiting criteria.

RQ=Result Qualifier

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols Report WGPP/ver. I
Ground Water Protection Program

lolus /2

Attention: Project:

Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20031183

					WSCF							
Sample #	Client ID	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Samp	le Receive
W030000754	B171B9 DUP 20030757	15067-28-4	Lead-214	SOIL	LA-508-462	U	-8,19	pCi/g	1.00	46	09/09/03 n/a	08/27/D3
W030000754	B171B9 DUP 20030757	E,T,C	Pb-214 Rel. Count Error (GEA)	SOIL	LA-508-462	turio de	⊦- 28.0	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	14331-83-0	Actinium-228	SOIL	LA-508-462	U	2.23	pCi/g	1.00	39	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Ac-228 Rel. Count Error (GEA)	SOIL	LA-508-462	arsi - i	F- 22.3	pCi/q	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	15065-10-8	Thorlum-234	SOIL	LA-508-462	U :	148	pCi/g	1.00	6.8e+02	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Th-234 Rel. Count Error (GEA)	SOIL	LA-508-462		+ 407	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	15117-96-1	Uranium-235	SOIL	LA-508-462	U	65.4	pCi/g	1.00	1.1e+02	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	U-235 Rel. Count Error (GEA)	SOIL	LA-508-462		- 67.4 ⊦- 67.4	pCi/q	1.00	0.0	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	14596-10-2	Americium-241	SOIL	LA-508-462	ψ .	-44.6	pCi/q	1.00	89	09/09/03 n/a	08/27/03
W030000754	B171B9 DUP 20030757	E,T,C	Am-241 Rel Count Error (GEA)	SOIL	LA-508-462	4	53.5	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000755	B171C0 DUP 20030757	10198-40-0	Cobalt-60	SOIL	LA-508-462	Ū	-0.146	pCi/q	1.00	0.30	: 09/09/03 . n/a	08/27/03
W030000755	B171CO DUP 20030757	E,T,C	Co-60 Rel. Count Error (GEA)	SOIL	LA-508-462	4	- 0.204	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000755	B171CO DUP 20030757	14234-35-6	Antimony-125	SOIL	LA-508-462	U	2.81	pCi/g	1.00	3 - W - 15 0/13	09/09/03 n/a	08/27/03
W030000755	B171C0 DUP 20030757	E.T.C	Sb-125 Rel. Count Error (GEA)	SOIL	LA-508-462		8.88	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000755	B171CO DUP 20030757	13967-70-9	Cesium-134	SOIL	LA-508-462		0.224	pCi/g	1.00	0.93	09/09/03 n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Cs-134 Rel. Count Error (GEA)	SOIL	LA-508-462	-	0.488	pCi/q	1.00	0.0	09/09/03 n/a	08/27/03
W030000755	B171C0 DUP 20030757	10045-97-3	Cesium-137	SOIL	LA-508-462		3.08e+03	pCi/g	1.00	3.5	09/09/03 n/a	08/27/03
v030000755	B171C0 DUP 20030757	E.T.C	Cs-137 Rel. Count Error (GEA)	SOIL	LA-508-462		- 422	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
3 030000755	B171CO DUP 20030757	14683-23-9	Europium-152	SOIL	LA-508-462	u.	-5.20	pCi/g	1.00	12:	09/09/03 n/a	08/27/03
₾030000755	B171C0 DUP 20030757	E,T,C	Eu-152 Rel. Count Error (GEA)	SOIL	LA-508-462		7.18	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
3 030000755	B171C0 DUP 20030757	15585-10-1	Europium-154	SOIL	LA-508-462	U	0.143	pĊi/g	1.00	2.2	09/09/03 n/a	08/27/03
30000755	B171C0 DUP 20030757	E,T,C	Eu-154 Rel. Count Error (GEA)	SOIL	LA-508-462		1.15	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
3 030000755	B171CO DUP 20030757	14391-16-3	Europium-155	SOIL	LA-508-462		-2.36	pCi/g	1.00	8.8	09/09/03 n/a	08/27/03
W030000755	8171CO DUP 20030757	E,T,C	Eu-155 Rel. Count Error (GEA)	PORTER DE LA COMP	LA-508-462		5.31	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000755	B171C0 DUP 20030757	15832-50-5	Tin-126	SOIL	LA-508-462	u del	3.45	pCi/g	1.00	4.0	09/09/03 n/a	08/27/03
W030000755	B171C0 DUP 20030757	E,T,C	Sn-126 Rel. Count Error (GEA)	SOIL	LA-508-462		- 3.62	pCi/g	1.00	0.0	09/09/03 n/a	08/27/03
W030000755	randa fili di da tanta tana ang kanada sa na mga mga mga mga mga aga sa mga mga mga mga mga mga mga mga mga mg	15262-20-1	Radium-228	SOIL	LA-508-462	u .	1.00	pCi/g	1.00	2.9	D9/09/03 n/a	08/27/03

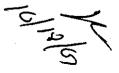
MDL=Minimum Detection Limit

U - Analyzed for but not detected above limiting criteria.

RQ=Result Qualifier

DF = Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols * Report WGPP/ver. 1



Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	WSCF20030757
Sample Matrix	Soil
Sample Visual	Brown
SAF Number	F03-006
Data Deliverable	Summary Report

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the Groundwater Protection Program-Letter of Instruction, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.
- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.
- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G - The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale

WSCF Production Control

<u>Abbreviations</u>

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline

Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

Customer Sample Number	Original Sample Delivery Group	}
B16W93	WSCF20030588	ĺ
B16W94	WSCF20030588	1
B16W95	WSCF20030588	
B16W96	WSCF20030598	
B16W97	WSCF20030598	·
B16W98	WSCF20030598	
B16W99	WSCF20030613	
B16WB0	WSCF20030613	
B16WB1	WSCF20030630	-
B16WB2	WSCF20030642	
B16WC0	WSCF20030567 Incl	ided in V
B171B9	WSCF20030757	.1
B171C0	WSCF20030757	
B171C1	WSCF20030757	
B17216	WSCF20030757	
B17217	WSCF20030757	
B17218	WSCF20030757	

WSCF 2003 1182

9/43/03

Introduction

GPP requested WSCF to rerun the above samples to include QC data for the GEA test. These samples were analyzed in accordance with the *Groundwater Protection Program-Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the client correspondence are included as Attachment 3.

Analytical Methodology for Requested Analyses

The GEA analysis was run by internal WDOE accredited WSCF procedures. Analytical
work was performed with no deviations to the approved method.

Comments

RadChem - There are no hold times associated with this WDOE accredited method. A Laboratory Control Sample, Blank and Duplicate (per agreement with the client, the duplicate is a recount of one the samples in the batch) were analyzed with this assigned delivery group. See page(s) 2-37, and 2-38 for QC details. The upper and lower limits for the BLANK (page 2-38) have been established as starting points for the GEA analysis. As more analyses are run, these limits will be adjusted.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale

WSCF Production Control

<u>Abbreviations</u>

Hg - mercury IC - ion chromatography ICP - inductively coupled plasma ICP/AES - ICP/atomic emission spectroscopy ICP/MS - ICP/mass spectrometry Total U - total uranium AT/TB - total alpha/total beta AEA - Alpha Energy Analysis WTPH-G - Total Hydrocarbons-Gasoline

Am - americium Cm - curium Pu - plutonium Np - neptunium GEA - gamma energy analysis H3 - Tritium Sr - Strontium 89, 90 WTPH-D - Total Hydrocarbons-Diesel TSS - Total Suspended Solids

BHI-EE-011 (03/01/2002)

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FH-Centra	al Plateau	Project		CI	LAIN OF CUST	ODY/S	SAMP	LE	ANALY	SIS			$oldsymbol{\perp}$	F03-	006-144	Page 1	of 1
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Project Designation 200-PW-2/200-PV	V-4 OU - Bore	hole Soil Sampling		Sampli 216-	ing Location	29-123 302).s	(3.5	5.5-3 8)	SAI F03	F Na -006	A	ir Quality		60 J	Days
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Shipped To 222-S Lab Operat	WSCF			Offsite Property No. Bill of Lading/Air Bill N/A N/A								ill No.				_	
POSSIBLE SAMP							\top							<u>† </u>	<u> </u>		
	-	•	<u>.</u>		Preservation	Cool 4C	Cool	4C	None	Nos							
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	,			- {	No. of Container(s)	2	1		7 305-30-03								
	7,6030	757		· ·	Volume	40mL	40m	nL	(20mL	60 <u>m</u>	ıL						
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THE WAY		Date/Time D. 5-30-13/49	<u> </u>	By/Stoo	27) KUF 5-30			**,7b	e laboratory is	to repor	t both	kerosene and diesel	ange c	ompounds from	WTPH-D anal	lysis.	S=Solt SE=Soliment SO=Solid
Relinquished By/Remov		Date/Time 603/03 13/5	Received	BySton		ate/Time 13	3.62	Gazzona	a Spec - Add-	on (Anti	mony-	1-137, Cobalt-60, Eur -125, Cesium-134, Ri	diun-	226, Radium-22	8, Tin-126}; Is	otopic	SI=Shadge W = Water
Relinquished By/Remov		Date/Time /400	Received)By/Store	din C	ate/Time /	1460	{Antin	oony, Arsenic,	Barium,	Bery	ic Uranium; Total Ura Ilium, Cadmium, Chro	omium,	Copper, Nicke	L Silver); ICP	Metals -	O=Oil A=Air DS=Drum Solids
Relinquished By/Remov		Date/Time	Received	By/Store		io 3/6: ate/Time		(Chlor	(Add-os) (Bi ide, Fluoride, pH (Soil) - 90	Nitroger	Seron. 1 in Ni	Lead, Selenium); Mitrate, Nitrogen in Nit	ercury rite, Su	- 14(11 - (CV), 1 lifate}; Total C)	C Anions - 300 ranide - 9010; /).0 Ammonia -	DL=Drum Liquid T=Tissue WI=Wipe
Relinquished By/Remov	ed From	Date/Time	Received	By/Store	ed In Da	atc/Time	- 1	120			i i	10 - Sr-90; Isotopia 1		. *	• •	•	L=Liquid V=Vegetation X=Other
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#1-200.8 & 6010 /man 06-05-03

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION A LEVEL:		В	(c)	D	E				
PROJECT: 20	0-8M-5/200	-PW-Y	DATA PACKAGE: WSCF 2003 0757						
VALIDATOR:	tct '	LAB: しょくCF							
CASE:			SDG: 30	157					
	·	ANALYSES	PERFORMED						
Grose Alpha/Beta	Strontium-90	Technoliym-99	Alpha Spectroscopy	Compa Spectroscopy					
Total Uranium	Radium-22	Trition							
SAMPLES/MAT	RIX								
(R171	39								
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2. Initial Calibr	ation (Levels D,	E)	••••••		AMA				
Instruments/dete	ectors calibrated	?	***************************************	******************	Yes No N/A				
Initial calibratio	n acceptable?	**********	***********	****************	Yes No N/A				
Standards NIST	traceable?		***************	***********************	Yes No N/A				
Data Validation De	and the Confidence	* * - * A * - * - * - * - * - *							

Standards Expired?Yes	: No	N/A
Calculation check acceptable?Yes	: No	N/A
Comments:		·
	· · · · · · · · · · · · · · · · · · ·	
		·····
3. Continuing Calibration (Levels D, E)		N/A
Calibration checked within required frequency?Yes		
Calibration check acceptable?Yes		
Calibration check standards traceable?Yes		
Calibration check standards expired?Yes		
Calculation check acceptable?Yes		
Comments:		
	·	
A. Dankerson A. Carrata (Laurata D. T.)	\checkmark	L 3 7 / A
4. Background Counts (Levels D, E)	···/	TRVA
Background Counts checked within required frequency?Yes	No	N/A
Background Counts acceptable?Yes	No	N/A
Calculation check acceptable?	No	N/A
Comments:		
		
		

5. Blanks (Levels B, C, D, E)	🗆 N/A
Method blank analyzed within required frequency?	Wes No N/A
Method blank results acceptable?	\sim
Analytes detected in method blank?	
Field blank(s) analyzed?	
Field blank results acceptable?	
Analytes detected in field blank(s)?	
Transcription/Calculation Errors? (Levels D, E)	\sim
Comments: Do	Pre- 1
6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E)	
LCS /BSS analyzed within required frequency?	Yes No N/A
LCS/BSS recoveries acceptable?	Wes No N/A
LCS/BSS traceable? (Levels D,E)	Yes No N/A
LCS/BSS expired? (Levels D,E)	Yes No (N/A)
LCS/BSS levels correct? (Levels D,E)	Yes No N/A
Transcription/Calculation Errors? (Levels D, E)	
7. Chemical Carrier Recovery (Levels C, D, E)	4
Chemical carrier added?	Yes No N/A
Chemical recovery acceptable?	Yes No N/A
Chemical carrier traceable? (Levels D, E)	Yes No N/A

Chemical carrier expired? (Levels D, E)	Yes No N/A
Transcription/Calculation errors? (Levels D, E)	
Comments:	
8. Tracer Recovery (Levels C, D, E)	□ N/A
Tracer added?	Vac No N/A
Tracer recovery acceptable?	
Tracer traceable? (Levels D, E)	
Tracer expired? (Levels D, E)	
Transcription/Calculation errors? (Levels D, E)	
Comments:	
9. Matrix Spikes (Levels C, D, E)	Ne via
	· · · · · · · · · · · · · · · · · · ·
Matrix spike analyzed?	
Spike recoveries acceptable?	
Spike source traceable? (Levels D, E)	
Spike source expired? Levels D, E)	
Transcription/Calculation Errors? (Levels D, E)	
Comments:	

10. Duplicates (Levels C, D, E)	🗆 N/A
Duplicates Analyzed at required frequency?	
RPD Values Acceptable?	
	$\bigcup_{i \in I} f_i$
Transcription/Calculation Errors? (Levels D, E) Comments: 400 4000 5 10/18	50-
Bismush 214 60 TT	
lead 2-14 48	
radium 224 60	
thallow 204 44	
11. Field QC Samples (Levels C, D E)	NA
Field duplicate sample(s) analyzed?	Yes No N/A
Field duplicate RPD values acceptable?	
Field split sample(s) analyzed?	
Field split RPD values acceptable?	
Performance audit sample(s) analyzed?	
Performance audit sample results acceptable?	
Comments:	
12. Holding Times (All levels)	
Are sample holding times acceptable?	Yes No N/A
Comments:	
	······································

13. Results and Detection Limits (All		\sim
Results reported for all required sample		
Results supported in raw data?(Levels	D, E)	Yes No NA
Results Acceptable? (Levels D, E)	***************************************	Yes No (N/A
Results Acceptable? (Levels D, E) Transcription/Calculation errors? (Lev	/els D, E)	Yes No (N/A
MDA's meet required detection limits'	?	Ye No NA
MDA's meet required detection limits' Transcription/calculation errors? (Lev	els D, E)	Yes No(N/)
Comments:	20m	<u> </u>
·		·
		<u></u>

Additional Documentation Requested by Client

SDG Number: WSCF20030757

Matrix: SOLID

Test: Uranium Isotopics by AEA

SAF Number: F03-006

Sample Date: 06/03/03

Receive Date: 06/03/03

QC Type

Analyte

CAS#

Results

Units

Analysis Date

Lower Limit Upper Limit

Lab ID:

W030000531

BATCH QC ASSOCIATED WITH SAMPLE

DUP U-288 by AEA

24678-82-8

20.000

BATCH QC

BLANK U-238 by AEA U-238 by AEA 24678-82-8 24678-82-8

9.0e-03 109,000 **PCG** % Recov

06/16/03 06/18/03 0.000

1000.000

Report w13q/rev.5.1 p 12 7-jul-2003 07:17:16

SDG Number: WSCF20030757

Matrix: SOLID

Test: Americium by AEA

SAF Number: F03-006 Sample Date:

06/03/03

Receive Date:

06/03/03

QC

Type Analyte

CAS#

Results

Units

Analysis Date

Lower Limit

Upper Limit

Lab ID:

W030000531

BATCH QC ASSOCIATED WITH SAMPLE

DUP Am-241 by AEA

BATCH QC

BLANK Am-241 by AEA LCS Am-241 by AEA 14596-10-2 14596-10-2 3.4e-02

PCG

06/16/03 % Recov . 06/18/03

0.000 75.000 1000.000

125.000

Report w13q/rev.5.1 p 13 7-jul-2003 07:17:16

SDG Number: WSCF20030757

Matrix: SOLID

Test: Plutonium Isotopics by AEA

SAF Number: F03-006

Sample Date: Receive Date:

06/03/03 06/03/03

QC

Type Analyte CAS#

Results

Units

Analysis Lower Date Limit

Upper Limit

Lab ID:

W030000531

BATCH QC ASSOCIATED WITH SAMPLE

Pu-239/240 by AEA

BATCH QC

BLANK Pu-239/240 by AEA Pu-239/240 by AEA LCS

PU-239/240 ₽U-239/240

6.4e-02 98.000 PCG % Recov 06/17/03

06/17/03

0.000 75,000 1000.000 125,000

Report w13g/rev.5.1 p 14 7-jul-2003 07:17:16

SDG Number: WSCF20031183 Matrix: SOLID Test: Gamma Energy Analysis-grd H2O

SAF Number: F03-006

Sample Date: Receive Date:08/27/03

Q	QC .					Analysis	Lower	Upper	
Ty	pe Analyte	CAS#	QC Found	QC Yield	Units	Date	Limit	Limit	RQ
	b ID: W03000075			•	w		•		
		TED WITH SAMPLE	. 2	Maria - 144-100000000000000000000000000000000		185 J. 1868 - C. 1868		The first of the common of the first	out to the control of
DUF DUF	8854, 8 T., 29000 866405 A.D.A. F 2005 F.	14331.83-0 14596-10-2	8.17e-01 U-3.89e-1	22,101 n/a	RPD RPD	09/09/03 09/09/03	0.000	20,000 20.000	
DUF	P Bismuth-212	14913-49-6	7,34e-01	n/a	RPD	09/09/03	0.000	20.000	
DUF	P Bismuth-214	14733-03-0	5.62e-01	60.546	RPD	09/09/03	0.000	20.000	·
DUF	Cerium-144 Cobalt-60	14762-78-8 10198-40-0	U-1.53g-1 U-4.86e-2	n/a n/a	RPD RPD	09/09/03 09/09/03	0.000	20,000 20,000	
DUF		13967-70-9	U5.30e-02	n/a	RPD	09/09/03	0.000	20.000	jalakski telo i jalanci uli a Alif 🗨 🗀
DUF	en en 1888 de 1870 kan de la companya da la company	10045-97-3	U6.62e-03	n/a	RPD	09/09/03	0.000	20.000	
DUF	Europium-152	14683-23-9	U8.52e-02	n/a	RPD	09/09/03	0.000	20,000	
DUP	P Europium-154	15585-10-1	U-2.58e-3	n/a	RPD	09/09/03	0.000	20.000	Carlot Anna Ca Carlot Anna Carlot Anna Ca
DUF	Europium-155	1439т-16-3	U-8.81e-2	n/a	RPD	09/09/03	0.000	20.000	
DUP	Niobium-94	14681-63-1	U8.34e-03	n/a	RPD	09/09/03	0.000	20.000	The second secon
DUP	 A Contract of the Contract of the	15092-94-1	6.76e-01	6.026	RPD	09/09/03	0.000	20.000	
DUP		15067-28-4	6.61e-01	48.133	RPD	09/09/03	0.000	20.000	•
DUP	 A 19 MARCH SELD STEAL AND SELECTION 	13982-63-3	5.62e-01	60.546	RPD	09/09/03	0.000	20.000	
DUP 2002		15262-20-1	8.17e-01	22.101	RPD	09/09/03	0.000	20.000	· · · · · · · · · · · · · · · · · · ·
DUP	S. N. HEN ANT MATERIAL PARKS III P NEW MARCHAR PARKS	13968-53-1	U1,97e-02	n/a	RPD	09/09/03	0.000	20,000	
DUP		13967-48-1	U1.39e-01 U-5.57e-2	n/a	RPD	09/09/03	0.000	20.000	essentation in the second of t
DUP		14234-35-6	3116616	n/a	RPD	09/09/03	0.000	20.000	
DUP	* * ***********************************	13966-06-8	U-1.87e-2	n/a	RPD	09/09/03	0.000	20.000	
DUP DUP	31 39900 19400 Quantity (1970) 2 - 44 (1970) 3 - 4 (1970) 4 (19	15832-50-5 15065-10-8	U1,07e-01 U2.12e+00	n/a	RPD	09/09/03	0,000	20,000	
DUP				n/a : 100324-4-20000	RPD	09/09/03	0.000	20.000	92 - Anni-Aramesia (1988) (1948) (1948) (1944)
1, 1, 1, 1, 1, 10,000000		14913-50-9	1.87e-01	44.813	RPD	09/09/03	0.000	20.000	
DUP		15117-96-1	U1.20e-01	n/a	RPD	09/09/03	0.000	20.000	er 100 m 5,000 m 5,000 5,000 500 500 1 1 1 1 1 1 1 1 1 1 1 1 1 1
DUP	ZINC-09	13982-39-3	U3.96e-02	tt/a	RPD	09/09/03	0.000	20.000	

SDG Number: WSCF20031183 Matrix: SOLID Test: Gamma Energy Analysis-grd H2O

SAF Number: F03-006

Sample Date: Receive Date:

QC						Analysis	Lower	Upper	
Туре	Analyte	CAS#	QC Found	QC Yield	Units	Date	Limit	Limit	RQ
BATCH	1 QC								
BLANK	Actinium-228	14331-83-0	U-9.34a-2	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Americium-241	14596-10-2	U-1,80e0	n/a	pCi/g	.09/15/03	-10000,000	1000.000	
BLANK	Bismuth-212	14913-49-6	U5.75e-01	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Bismuth-214	14733-03-0	4.646-01	0.464	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Cerium-144	14762-78-8	U-4.77e-1	п/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Cobalt-60	10198-40-0	U2.25e-02	n/a	pCi/g	09/15/03	∴10000.000	1000.000	
BLANK	Cesium-134	13967-70-9	U-4.04e-2	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Cesium 137	10045-97-3	U5.89e-02	h/a	pCl/g	09/15/03	-10000.000	1000.000	::
BLANK	Europium-152	14683-23-9	U5.04e-03	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Europium-154	15585-10-1	U-1.75e-1	п/а	ρCi/g	09/15/03	+10000.000	1000.000	
BLANK	Europium-155	14391-16-3	U1.87e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Niobium-94	14681-63-1	U4.18e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	그 사이 그는 그것 그 축약을 즐겁니다.
BLANK	Lead-212	15092-94-1	U2.20e-01	n/a	pCi/g	09/15/03	-10000.000	1000.000	and the second s
BLANK	Lead-214	15067-28-4	6.14e-01	0.614	pCi/g	09/15/03	-10000,000	1000.000	
BLANK	Radium-226	13982-63-3	4.64e-01	0.464	pCi/g	09/15/03	-10000.000	1000.000	- 97 PT - 100,000 - 97 1,000 1
BLANK	Radium-228	15262-20-1	U-9.34e-2	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Ruthenium-103	13968-53-1	U2.10e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	en e
BLANK	Ruthenium-106	13967-48-1	U5.33e-01	π/a	pCI/g	09/15/03	10000,000	1000.000	
BLANK	Antimony-125	14234-35-6	U-3.84e-2	n/a : · .	pCi/g	09/15/03	-10000.000	1000.000	united the control of the seed of the conditional transformation of the control o
BLANK	Tio-113:	13966-06-8	U1.97e-02	n/a	pCi/g	09/15/03	-10000.000	1000.000	
BLANK	Tin-126	15832-50-5	U-2.26e0	n/a	pCi/g	09/15/03	-10000.000	1000.000	recitation of the control
BLANK	Thorium-234	15065-10-8	U-4.43e0	n/a	pCi/g	09/15/03	-10000,000	1000.000	
BLANK	Thallium-208	14913-50-9	U1.33e-01	n/a	pCi/g	09/15/03	-10000.000	1000.000	A. 1990A. Grand & 1988 SANGER STORY AND THE STORY AND ST
BLANK	Uranium-235	15117-96-1	U-8.14e-1	ri/a	pCi/g	09/15/03	-10000 000	1000,000	
BLANK	Zinc-65	13982-39-3	U-2.42e-1	n/a	pCi/g	09/15/03	-10000.000	1000.000	5.0 The Colom 4556 Contract \$88.4 feet at \$15.0 \$18880 co. 1566 c
LCS	Americium-241	14598-10-2	3.92e+03	100,000	% Recov	09/05/03	80,000	120.000	
LCS	Cobalt-60	10198-40-0	4.14e+03	98.807	% Recov	09/05/03	80.000	120.000	
LCS	Cesium-137	10045-97-3	3.73e+03	104.190	% Recov	09/05/03	80:000	120.000	

Date: 17 November 2003

To: Fluor Hanford Inc. (technical representative)

From: TechLaw, Inc.

Project: 200-PW-2/200-PW-4 OU Borehole Soil Sampling

Subject: PCBs - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 30757 prepared by WSCF. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	С	PCBs by 8082

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev.1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by the Client

DATA QUALITY OBJECTIVES

Holding Times/Sample Preservation

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected

sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blank

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than practical quantitation limit (PQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than PQL, the result is qualified as undetected and elevated to the PQL.

All method blank target compound results were acceptable.

Field Blanks

No equipment blanks were submitted for analysis.

Accuracy

Matrix Spike/Blank Spike

Matrix spike and blank spike analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations and is done in duplicate. Matrix spike and blank spike analyses must be within control limits of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All blank spike results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the

unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Field Duplicate Samples

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the target quantitation limits to ensure that laboratory detection levels meet the required criteria. All undetected results exceeded the analyte specific TQL. Under the FHI statement of work, no qualification is required.

Completeness

Data Package No. 30757 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All undetected results exceeded the analyte specific TQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, Validation Statement of Work, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan, December 2000.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Summary of Data Qualification

PESTICIDE DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE_1_OF_1_						
COMMENTS: No qualifiers assigned									

Qualified Data Summary and Annotated Laboratory Reports

Laboratory: WSCF							
Case:	SDG:	WSCF2	0030	757			
Sample Number		B171B9					
Remarks							
Sample Date		5/30/02					
Analysis Date		6/13/03		T			
PCB	RDL	Result	Q	Result	Q	Result	Q
Aroclor-1016	16.5	<110	U				Т
Arocior-1221	16.5	<110	U.				T
Aroclor-1232	16.5	<110	U		1		T
Aroclor-1242	16.5	<110	U				T
Aroclor-1248	16.5	<110	U		T		Т
Aroclor-1254	16.5	140			Т		T
Aroclor-1260	16.5	<110	Ü		1	1	T
Arolcor-1262	16.5	<110	U				
Aroclor-1268	16.5	<110	บ				

WSCF ANALYTICAL RESULTS REPORT

Attention: Project: Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

					WSCF						
Sample #	Client ID	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample Receive
W030000533	B171B9 GPP TRENT	7439-96-5	Manganese by ICP-MS	SOUD	LA-505-412		139	ug/g	4,73	1.4	06/18/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	7439-97-6	Mercury by ICP-MS	SOLID	LA-505-412		1.31	ug/g	4.73	0.47	06/18/03 05/30/03 06/03/03
W030000533	817189 GPP TRENT	7439-98-7	Molybdenum by ICP-MS	SOLID	LA-505-412	U	₹ 1,42	ug/g	4.73	1.4	06/18/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	7440-02-0	Nickel by ICP-MS	SOLID	LA-505-412	fi delete libere	5.48	ug/g	4.73	2.4	06/18/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	7782-49-2	Selenium by ICP-MS	SQLID	LA-505-412	Ü	< 1,42	ug/g	4,73	1.4	06/18/03 05/30/03 06/03/03
W030000533	817189 GPP TRENT	7440-22-4	Silver by ICP-MS	SOLID	LA-505-412	EU	< 0.946	ug/g	4.73	0.95	06/18/03 05/30/03 06/03/03
W030000533	B17189 GPP THENT	7440-28-0	Thallium by ICP-MS	SOLID	LA-505-412	U	< 0.473	ug/g	4.73	0.47	06/18/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	7440-29-1	Thorium by ICP-MS	SOLID	LA-505-412	*1-1-1-1-1-1-1-	3.46	ug/g	4.73	0,95	06/18/03 05/30/03 06/03/03
W030000533	817189 GPP TRENT	7440-61-1	Urenium by ICP-MS	SOLID	LA-505-412		28.0	ug/g	4,73	0.47	06/18/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	7440-62-2	Vanadium by ICP-MS	SOLID	LA-505-412	212121212121	45.4	ug/g	4.73	1.9	06/18/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	7440-66-6	Zinc by ICP-MS	SOLID	LA-505-412		25.4	ug/g	4.73	19	06/18/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	TPH-G	Total Pet. Hydrocarbons Gas	SOLID	NWTPH	บ	< 500	ug/kg	12 25 11 25 1115	5.0e + 02	06/12/03 05/30/03 06/03/03
- W030000533	817189 GPP TRENT	12674-11-2	Arocler-1016	SOLID	LA-523-427	U	< 110	ug/kg	1,00	1.1e+02	06/13/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	11104-28-2	Aroclor-1221	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03 06/03/03
W030000533	617189 GPP TRENT	11141-16-5	Arocior-1232	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1s+02	06/13/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	53469-21-9	Aroclor-1242	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	12672-29-6	Aroclor-1248	SOUD	LA-523-427	Ü	< 110	ug/kg	1,00	1,1e+02	06/13/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	11097-69-1	Arocior-1254	SOLID	LA-523-427	J	140	ug/kg	1.00	1.1e+02	06/13/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	11096-82-5	Aroclor-1260	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1++02	06/13/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	37324-23-5	Aroclor-1262	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1a+02	06/13/03 05/30/03 06/03/03
- W030000533	B171B9 GPP TRENT	11100-14-4	Aracler-1268	SOLID	LA-523-427	Ù	< 110	ug/kg	1.00	1,1e + 02	06/13/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	13981-16-3	Pu-238 by AEA	SOLID	LA-508-471	U	-0.120	pCi/g		0.32	06/17/03 05/30/03 06/03/03
	B17189 GPP TRENT	E/T,C	Pu-238 by AEA Total Critin Error	SOLID	LA-508-471		140	%		0,0	06/17/03 05/30/03 06/03/03
1 -	B17189 GPP TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOLID	LA-508-471		21.0	%	1,121,111	0.0	06/17/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	PU-239/240	Pu-239/240 by AEA	SOUD	LA-508-471		3.90	pCi/g		0.077	06/17/03 05/30/03 06/03/03
	B171B9 GPP TRENT	120-82-1	1,2,4-Trichlorobenzene	SOLID	LA-523-456	U	< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03 05/30/03 06/03/03
the state of the s		95-50-1	1,2-Dichlorobenzene (SV)	SOLID	LA-523-456	υ	< 1,90e+03	ug/kg	1.00	1.9e + 03	06/09/03 05/30/03 06/03/03

MDL=Minimum Detection Limit

E - Analyte is an estimate, has potentially larger errors

RQ=Result Qualifier

U - Analyzed for but not detected above limiting criteria.

J - Estimated Value

DF=Dilution Factor

• - Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

Report W004/ver. 5.1

Ground Water Protection Program



Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	WSCF20030757
Sample Matrix	Soil
Sample Visual	Brown
SAF Number	F03-006
Data Deliverable	Summary Report

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the Groundwater Protection Program-Letter of Instruction, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.
- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.
- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D - The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G - The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale

WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis

WTPH-G - Total Hydrocarbons-Gasoline

Am - americium
Cm - curium
Pu - plutonium
Np - neptunium
GEA - gamma energy analysis
H3 - Tritium
Sr - Strontium 89, 90
WTPH-D - Total Hydrocarbons-Diesel
TSS - Total Suspended Solids

FH-Central Platea	u Project_	C	HAIN OF CUST	FODY/S	SAMPLE	E ANAL	YSIS	REC	UEST		F03	-006-144	Page 1	of 1
Collector Johansen/Pope/Pfister			Company Contact Telephone No. Project Coordin LC Hulstrom 373-3928 TRENT; SJ				ator	Price Code	8N	Data Tur				
Project Designation 200-PW-2/200-PW-4 OU - Bo	orehole Soil Sampling	Samp 21	ling Location 775 6-6-B-12 (C3246); (32'-35')	29-03 - 30-7	3.E (3	5.5-38') SAF No. Air Quality 60 Da					Days ———			
Ice Chest No.			Field Logbook No. COA Method of Shipment Government Vehicle											
Shipped To 255C 222-S Lab Operations 27	F 6/3/03_	Offsi N/	te Property No. A					Bill o	f Lading//	Lir Bill N	o.	·		
POSSIBLE SAMPLE HAZA	RDS/REMARKS			Cool 4C	Cooi 4C	None	Nor							
·			Preservation	aG	· aG	#G	a C							<u> </u>
Special Handling and/or S	torage	•	Type of Container	2	1	1.	1		-			<u> </u>		
	· 	•	No. of Container(s)	40mL	40mL	120mir	60m	<u></u> _			<u> </u>			
7.60 2	20757		Volume	VOA-	Semi-VOA -	See item (1) in	See Item	m =						ļ
· ·	SAMPLE ANALY	(SIS		\$260A - Complete	8270A (TCL); PCBs - 8082	Special Instructions.	Speci	<u>ا</u> ` اُسْنَا		÷			l i	
	· · · · · · · · · · · · · · · · · · ·		:	STL	STL	W	E			•	TIETO:			
Sample No.	Matrix *	Sample Date												
B171B9 W0 30001533	SOIL	5-31.	03 1140							· ·	引りれ		·	
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CHAIN OF POSSESSIO		Sign/Prin		-!	SPE	CLAL INSTR	UCTIO	ONS	<u></u>		1	<u>.l</u>	<u> </u>	Matrix *
Relinquished By/Removed From	Date/Time Date/Time	Received By/Sto		rate/Time 103 (4) rate/Time 13	5 "7					, -	compounds from		•	S=Soil SE=Sodiment SO=Sotid SI=Studge
HO-64-4277 Kef Relinquished By/Removed From Gres Thomas Trus	6/03/03 /3/5 L Date/Time 1400 Turnet //03/03	Received By/Sto						W = Water O=Oil A=Air DS=Drum Solids						
Relinquished By/Removed From	Date/Time	Received By/Sto		ate/Time	(Cb) 350.	oride, Fluoride, l ; pH (Soil) - 90	Nitroger 145	in Nitra	te, Nitrogen	in Nitrite, S	Sulfate); Total C	/anide - 9010; /	Ammonia -	DL-Drum Liquid T=Tissue Wl=Wipe L=Liquid
Relinquished By/Removed From	Date/Time		ceived By/Stored In Date/Time (2) Technolium 29.90 Sc 90; Isotopic Thorium 232); Neptunium 237; Iodi 129 WTPH-D & WTPH-G MMV/06-05-03						V=Vegetation X=Other					
Relinquished By/Removed From	·.	Received By/Sto		ate/Time				·						
LABORATORY Received By SECTION				T	itle			i i				, D	ate/Time	
FINAL SAMPLE Disposal Met DISPOSITION	bod		·	 		Dispo	sed By			-		, r	ate/Time	

BHI-EE-011 (03/01/2002)

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	В	(c)	D	E			
PROJECT: 200	2-8M-5 200-	-PW-4	DATA PACKAGE: WSCF 20030757					
VALIDATOR:	TLI	LAB: WSCF			18/0			
CASE:			sdg: 3	0757				
		ANALYSES	PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	3W-846 8081 (TCLP)		-			
SAMPLES/MAT	RIX	· · · · · · · · · · · · · · · · · · ·						
8171	139							
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					5011			
1. DATA PA	ACKAGE COMPI	ETENESS AND	CASE NARRATIV	E				
Technical verificat	ion documentation j	present?	***************************************		Yes No N/A			
Comments:								
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Comments:		· · · · · · · · · · · · · · · · · · ·						

5. PRECISION (Levels C, D, and E)	
Duplicate RPD values acceptable?	(Yes) No N/A
Duplicate results acceptable?	
MS/MSD standards NIST traceable? (Levels D, E)	
MS/MSD standards expired? (Levels D, E)	
Field duplicate RPD values acceptable?	
Field split RPD values acceptable?	Yes No NA
Transcription/calculation errors? (Levels D, E)	Yes No NA
Comments:	No FB
6. SYSTEM PERFORMANCE (Levels D and E) Chromatographic performance acceptable?	Yes No N/A
Positive results resolved acceptably?	
Comments:	
7. HOLDING TIMES (all levels)	
Samples properly preserved?	Yes No N/A
Sample holding times acceptable?	
Comments:	

3. BLANKS (Levels B, C, D, and E)		/	
Calibration blanks analyzed? (Levels D, E)	Yes	No(MAI
Calibration blank results acceptable? (Levels D, E)	Yes	No(N/A
Laboratory blanks analyzed?	Yea	No	N/A
Laboratory blank results acceptable?	(Yes)	No	N/A
Field/trip blanks analyzed? (Levels C, D, E)	Yes(W	N/A
Field/trîp blank results acceptable? (Levels C, D, E)	Yes	No(N/A
Transcription/calculation errors? (Levels D, E)			_
Comments:			
			
	·		
4. ACCURACY (Levels C, D, and E)			
Surrogates analyzed?	- /		N/A
Surrogate recoveries acceptable?	(Yes)	No	N/A
Surrogates traceable? (Levels D, E)	Yes	No	(N/A)
Surrogates expired? (Levels D, E)	Yes	No	(N/A)
MS/MSD samples analyzed?	Yes) No	N/A
MS/MSD results acceptable?			
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	(N/A)
MS/MSD standards expired? (Levels D, E)	Yes	No	NA
LCS/BSS samples analyzed?) No	N/A
LCS/BSS results acceptable?		No	N/A
Standards traceable? (Levels D, E)			(NIA)
Standards expired? (Levels D, E)		No	X(A)
Transcription/calculation errors? (Levels D, E)	Yes	No	MA
Performance audit sample(s) analyzed?	Yes	(No) N/A
Performance audit sample results acceptable?	Yes	No	N/A
Comments:	110000	<u> </u>	

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DET	TECTION LIMITS (all levels)
Compound identification acceptable? (Levels D, E)	Yes No N/A
Compound quantitation acceptable? (Levels D, E)	Yes No N/A
Results reported for all requested analyses?	Yes No N/A
Rresults supported in the raw data? (Levels D, E)	Yes No NA
Samples properly prepared? (Levels D, E)	Yes No WA
Detection limits meet RDL?	Yes (No) N/A
Transcription/calculation errors? (Levels D, E)	Yes No (N/A)
9. SAMPLE CLEANUP (Levels D and E)	Vac. No N/A
Fluoricil ® (or other aborbant) cleanup performed?	The state of the s
Lot check performed?	L :
Check recoveries aceptable?	
GPC cleanup performed?	
GPC check performed?	I I
GPC check recoveries aceptable?	
GPC calibration performed?	· · · · · · · · · · · · · · · · · · ·
GPC calibration check performed?	
GPC calibration check retention times acceptable?	
Check/calibration materials traceable?	
Check/calibration materials Expired?	
Analytical batch QC given similar cleamup?	
Transcription/Calculation Errors?	\ /

Additional Documentation Requested by Client

SDG Number: WSCF20030757

Matrix: SOLID

Test: PCBs complete list

SAF Number: F03-006

Sample Date: 05/30/03 Receive Date: 06/03/03

QC Analysis Lower Upper Type Analyte CAS# Results Units Date Limit Limit

Lab ID: W030000532

BATCH QC ASSOCIATED WITH SAMPLE

MS	Aroslor-1260	**	11096-82-5	111.000	% Recov	06/13/03	75.000	125.000
MS	Decachlorobiphenyl	Surr	2051-24-3	115.000	% Recov	06/13/03	50.000	150.000
MS	Tetrachloro-m-xylana	Surr	877-09-8	95.000	% Recov	06/13/03	50.000	150.000
MSD	Aroclor-1260	n en	11096-82-5	96.400	% Recov	06/13/03	75.000	125.000
MSD	Decachlorobiphenyl	Surr	2051-24-3	120.000	% Recov	06/13/03	50.000	150.000
MSD	Tetrachioro-m-xylene	Surr	877-09-8	87.600	% Recov	06/13/03	50,000	150.000
SPK-RP	D Arcclor-1260	13:00:00:00:00:00:00:00:00:00:00:00:00:00	11096-82-5	14.079	RPD	06/13/03	0.000	25.000
SPK-RP	Decachlorobiphenyl	Surr	2051-24-3	4.255	RPD	06/13/03	0.000	20.000
SPK-RP	D Tetrachloro-m-xviene	Surr	877-09-8	8.105	RPD	06/13/03	0.000	20.000
SURR	Decachlorobiohenyl	Surr	2051-24-3	127.000	% Recov	06/13/03	50.000	150.000
SURF	Tetrachlora-m-xylene	MANG TATAMANAN IN INTERNATION	877-09-B	106,000	victorités interes	06/13/03	50.000	150.000

W030000533 Lab ID:

BATCH QC ASSOCIATED WITH SAMPLE

SURR	Tetrachioro-m-xylene	Surr	877-09-8	102.000	06/13/03	50.000 50.000	150.000

BATCH QC

BLANK	Araclor-1016		12874-11-2	< 100	ug/Kg 06	/13/03		
BLANK	Aroclor-1221		11104-28-2	< 100	ug/Kg 06	/13/03	ere com term a meneral para como como a sobre en como	
BLANK	Aroclor-1232		11141-16-5	< 100	ug/Kp 06	/13/03		
BLANK	Aroclor-1242		53469-21-9	< 100	ug/Kg 06,	/13/03	1	
BLANK	Atocior-1248		12672-29-6	< 100	seed a transfer of the seed of	/13/03		
BLANK	Aroclor-1254		11097-69-1	< 100	ug/Kg 06	/13/03		•
BLANK	Aroctor-1260		11096-82-5	< 100	, ug/Kg 06	/13/03		
BLANK	Aroclor-1262		37324-23-5	< 100	ug/Kg 06	/13/03		
BLANK	Argelor-1268		11100-14-4	< 100	ug/Kg 06	/13/03		
BLANK	Decachlorobiphenyl	Surr	2051-24-3	120.000	% Recov 06	/13/03	60.000	150.000
BLANK	Tetrachloro-m-xylane	Surr	877-09-8	60,300	% Recov O6	/13/03	50,000	150,000
LCS	Aroclor-1260		11096-82-5	115.000	% Recov 06	/13/03	70.000	130.000
LCS	Decachlorobiphenyl	Surr	2051-24-3	117:000	% Recov. OB	/13/03	50.000	150,000
LCS	Tetrachloro-m-xylene	Surr	877-09-8	103.000	% Recov O6	/13/03	50.000	150.000

Date: 17 November 2003

To: Fluor Hanford Inc. (technical representative)

From: TechLaw, Inc.

Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling

Subject: Volatiles - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. 30757 prepared by WSCF. A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	С	See note 1

1 - Volatiles by EPA 8260A.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

Holding Times/Sample Preservation

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Preserved water samples must be analyzed within: 14 days of the date of sample collection for VOAs. If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the project quantitation limit (MDL) and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the MDL, qualified as undetected and flagged "U".

All method blank results were acceptable.

Field Blanks

No field duplicate samples were submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike

Matrix spike/matrix spike duplicate and blank spike analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate are used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within 70-130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All MS/MSD and blank spike results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

All surrogate recovery results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Sample results must be within RPD limits of +/- 35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

Detection Limits

Reported analytical detection levels are compared against the target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. Twelve analytes exceeded the analyte specific TQL. Under the FHI statement of work, no qualification is required.

Completeness

Data package No. 30757 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Twelve analytes exceeded the analyte specific TQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, Validation Statement of Work, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan, December 2000.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.

 The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

VOLATILE DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE 1 OF 1
COMMENTS: No qualifiers as	signed		

Qualified Data Summary and Annotated Laboratory Reports

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Project: BECHTEL-HANFORD				1					
Laboratory: WSCF				1					
Case:	CF2003075	57	1						
Sample Number	B171B9				T		T		
Remarks					-	1			
Sample Date		05/30/03							
Analysis Date		06/12/03						***************************************	
VOA/Alcohols	TQL	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1-Trichloroethane	5	<21.0	Ū						
1,1,2,2-Tetrachloroethane*		<21.0	U					<u> </u>	1
1,1,2-Trichloroethane		<21.0	U						1
1,1-Dichloroethane*	10	<21.0	U						1
1,1-Dichloroethene*	5	<21.0	U			1			
1,2-Dichloroethane		<21.0	U						
1,2-Dichloroethene (cis & trans)		<21.0	U						
1,2-Dichloropropane		<21.0	Ų						
2-Butanone*	10	<21.0	U			Ċ			
2-Hexanone		<21.0	Ų		<u> </u>	<u> </u>			
4-Methyl-2-pentanone		<21.0	U						
Acetone		<21.0	U					ļ	
Benzene*	5	<21.0	U		1			<u> </u>	$oldsymbol{ol}}}}}}}}}}}}}}}}}$
Bromodichloromethane		<21.0	U		$oldsymbol{ol}}}}}}}}}}}}}}}}}$			<u> </u>	↓
Bromoform		<21.0	U						Ш_
Bromomethane		<21.0	U						\bot
Carbon Disulfide		<21.0	U		<u> </u>	<u> </u>			┷
Carbon Terachloride*		<21.0	U	ļ	—	1		<u> </u>	
Chlorobenzene*	5	<21.0	U	ļ	↓				↓
Chloroethane		<21.0	U		↓	ļ		1.	↓
Chloroform*	5	<21.0	U	ļ <u>.</u>		<u> </u>			
Chloromethane		<21.0	U		↓_				₩
Dibromochloromethane		<21.0	U		Ь.	<u> </u>			—
Ethy!benzene*		<21.0	U	ļ <u>.</u>	┷	ļ			₩
Methylene chloride*	5		 		 	1	_	ļ	
Styrene		<21.0	U	ļ	┿	<u> </u>	_		
Tetrachloroethene		<21.0	U		╄	<u> </u>			₩
Toluene*		<21.0	U		-				
Total xylenes*	5	<21.0	U	 	-	<u> </u>	-	 	
Trichloroethene		<21.0	U	 	-├	.	+	 	
Vinyl chloride		<21.0	U		+	-	+	+	+
cis-1,3-Dichloropropene		<21.0	U		╂	-		-	+
trans-1,3-Dichloropropene		<21.0	<u> </u>	 	+	-	-		+-
N. N. A. G		 			+				+
NA = Not analyzed			<u> </u>	 	+	1	+	1	+-
		ļ		 	-	1	+	-	+
* - TQL exceeded			\vdash	 	-	 	-	+	+
		L		<u> </u>		1			

WSCF ANALYTICAL RESULTS REPORT

Attention: Project: Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

							WSCF						
	Sample #	Client II)	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample Receive
	W030000533	B17189	GPP TRENT	91-20-3	Naphthalene	SOUD	LA-523-456	Ü	< 1.50e+03	ug/kg	1,00	1.5e + 03	06/09/03 05/30/03 06/03/03
ļ	W030000533	B171B9	GPP TRENT	98-95-3	Nitrobenzene	SOLID	LA-523-458	U	< 1.40e+03	ug/kg	1,00	1.4e+03	06/09/03 05/30/03 06/03/03
	W030000533	B17189	GPP TRENT	87-86-5	Pentachlorophenol	SOLID	LA-523-456	ָּט	< 1,60e+03	ug/kg	1.00	1.6e + 03	06/09/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	85-01-8	Phananthrene	SOLID	LA-523-456	ប	< 350	ug/kg	1.00	3.5e + 02	06/09/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	108-95-2	Phenol	SOLID	LA-523-456	U	< 520	ug/kg	1,00	5,2e+02	06/09/03 05/30/03 06/03/03
0	W030000533	B171B9	GPP TRENT	129-00-0	Pyrene	SOLID	LA-523-456	U	< 350	ug/kg	1.00	3.5e+02	06/09/03 05/30/03 06/03/03
0	WQ30000533	B17189	GPP TRENT	111-44-4	bis(-2-Chloroethyl)Eth	SOLID	LA-523-456	U	< 1.30e+03	ug/kg	1.00	1.3e + 03	06/09/03 05/30/03 06/03/03
	W030000533	B17189	GPP TRENT	111-91-1	bis(2-Chloroethoxy)methane	SOLID	LA-523-456	U	< 590	ug/kg	1.00	5.9e+02	06/09/03 05/30/03 06/03/03
\circ	W030000533	B171B9	GPP TRENT	13966-29-5	U-234 by AEA	SOLID	LA-508-471		4,70	pCi/g		0,063	06/16/03 05/30/03 06/03/03
1	W030000533	B17189	GPP TRENT	E,T,C	U-234 by AEA Total Cntg Error	SOLID	LA-508-471	121,121,11	27.0	%	na gearne riegra e ini	0.0	06/16/03 05/30/03 06/03/03
1	W030000533	817189	GPP TRENT	15117-96-1	U-235 by AEA	SOLID	LA-508-471		0.260	pCi/g		0.069	06/16/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	E,T,C	U-235 by AEA Total Cntg Error	SOLID	LA-508-471		47.0	%		0.0	06/16/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	24678-82-8	U-238 by AEA	SOLID	LA-508-471		4,70	pCi/g		0.023	06/16/03 05/30/03 06/03/03
. <u> </u>	W030000533	B171B9	GPP TRENT	E,T,C	U-238 by AEA Total Cntg Error	SOLID	LA-508-471		27.0	%		0.10	06/16/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	71-55-8	1,1,1-Trichlorgethane	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	W030000533	B17189	GPP TRENT	79-34-5	1,1,2,2-Tetrachloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	W030000533	B17189	GPP TRENT	79:00-5	1,1,2-Trichlorgethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	75-34-3	1,1-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	W030000533	B17189	GPP TRENT	75-35-4	1,1-Dichloroethene	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	107-06-2	1,2-Dichloroethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	W030000533	817189	GPP TRENT	540-59-0	1,2-Dichloroethene (cis & tran	SOLID	LA-523-455	υ	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	78-87-5	1,2-Dichloropropane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	W030000533	B17189	GPP TRENT	78-93-3	2-Butanone	SOLID	LA-523-455	υ	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	591-78-6	2-Hexanone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03, 05/30/03 06/03/03
	W030000533	817189	GPP TRENT	108-10-1	4-Mathyl-2-pentarione	SOLID	LA-523-455	ψ.	< 21,0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	67-64-1	Acetone	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
	W030000533	B171B9	GPP TRENT	71-43-2	Benzene	SOLID	LA-523-455	Ú	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03/03
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MDL=Minimum Detection Limit RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors
U - Analyzed for but not detected above limiting criteria.

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DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols * Report W004/ver. 5.1 Ground Water Protection Program



J - Estimated Value

WSCF ANALYTICAL RESULTS REPORT

Attention: Project:

Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

				•		WSCF							
Sample #	Client ID	•	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample Reco	eive
W030000533	817189 GP	P TRENT	75-27-4	Bromodichioromethane	SOUD	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B171B9 GP	P TRENT	75-25-2	Bromoform	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B17189 GP	P TRENT	74-83-9	Bromomethane	SOLID	LA-523-455	u	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	817189 GP	P TRENT	75-15-0	Carbon Disulfide	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W03QQQ0533	817189 GPI	PTRENT	56-23-5	Carbon Tetrachlorida	SOUD	LA-523-455	u	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B17189 GPI	P TRENT	108-90-7	Chlorobenzene	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B171B9 GP	P TRENT	75-00-3	Chloroethane	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B171B9 GP	P TRENT	67-66-3	Chloroform	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B17189 GP	PTRENT	74-87-3	Chloromethane	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1,00	21	08/12/03 05/30/03 05/03	3/03
W030000533	B171B9 GP	P TRENT	124-48-1	Dibromochloromethane	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B171B9 GPI	PTRENT	100-41-4	Ethylbenzene	SOLID	LA-523-455	ט	< 21.0	ug/kg	: 1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B171B9 GPI	P TRENT	75-09-2	Methylene Chloride	SOLID	LA-523-455	eteraning installer.	1.60e+03	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	817189 GPI	P TRENT	100-42-5	Styrène	SOLID	LA-523-455	Ú	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B171B9 GP	P TRENT	127-18-4	Tetrachioroethene	SOLID	LA-523-455	Ü	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
WD30000533	B171B9 GPI	PTRENT	108-88-3	Toluene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B171B9 GP	P TRENT	1330-20-7	Total Xylenes	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B171B9 GP	P TRENT	79-01-6	Trichlaroethene	SOLID	LA-523-455	Ų	< 21.0	ug/kg	1,00	21	06/12/03 05/30/03 06/0	3/03
W030000533	B171B9 GP	PTRENT	75-01-4	Vinyl Chloride	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B17189 GP	PTRENT	10061-01-5	cis-1,3-Dichleropropene	SOLID	LA-523-455	U	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B17189 GPF	PTRENT	10061-02-6	trans-1,3-Dichloropropene	SOLID	LA-523-455	υ	< 21.0	ug/kg	1.00	21	06/12/03 05/30/03 06/03	3/03
W030000533	B171B9 GPI	P TRENT	TPHKEROSENE	Kerosane	SOLID	NWTPH	V .	< 1.60e+04	ug/kg	1,00	1.6e + 04	06/12/03 05/30/03 06/03	3/03
W030000533	B17189 GP	PTRENT	68476-34-6	Total Pet. Hydrocarbons Diesel	SOLID	NWTPH	υ	< 1.60e+04	ug/kg	1.00	1.6e+04	06/12/03 05/30/03 06/03	3/03
W030000533	B17189 GP	PTRENT	84-15-1	ortho-Terphenyl	SOLID	NWTPH		9,60e+04	ug/kg	1.00	2.1e+03	06/12/03 05/30/03 06/0	3/03

MDL=Minimum Detection Limit RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors

U - Analyzed for but not detected above limiting criteria.

J - Estimated Value

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report W004/ver. 5.1

Ground Water Protection Program



Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	WSCF20030757
Sample Matrix	Soil
Sample Visual	Brown
SAF Number	F03-006
Data Deliverable	Summary Report

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the Groundwater Protection Program-Letter of Instruction, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.
- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.
- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D - The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale

WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline

Am – americium
Cm – curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

BHI-EE-011 (03/01/2002)

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	В	(c)	D	E
PROJECT: 7 00	J-PW-2/200	-Pw-4	DATA PACKAC	ie: WSCF2	030757
VALIDATOR:	tl1	LAB: Jus	cF.	DATE: 10/1	ह्मि
CASE:			SDG:	30757	
)	ANALYSES	PERFORMED		,
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MAT	rix	· · · · · · · · · · · · · · · · · · ·	14.		
B1718	59	B17189	-Kidelas	······································	
Technical verificat	ion documentation	present?		/E	Yes No N/A
Comments:					
			ON (Levels D and	E)	Yes No N/A
		_			Yes No N/A
					Yes No N/A
					Yes No N/A
		•		•	Yes No N/A
Calculation check	acceptable?	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Yes No N/A

3.	BLANKS (Levels B, C, D, and E)			
Calib	ration blanks analyzed? (Levels D, E)	Yes	No	(MV)
Calib	eration blank results acceptable? (Levels D, E)	Ye	No(NA
Labo	retory blanks analyzed?		No	N/A
Labo	ratory blank results acceptable?		No	N/A
	Utrip blanks analyzed? (Levels C, D, E)			
Field	Vtrip blank results acceptable? (Levels C, D, E)	Ya	No '	W)
Trans	scription/calculation errors? (Levels D, E)	Yes	No	(V)
Com	ments:	No FB		
4.	ACCURACY (Levels C, D, and E)			
Surr	ogates/system monitoring compounds analyzed?	(Yes	No	N/A
Surr	ogate/system monitoring compound recoveries acceptable?		No	N/A
Surr	ogates traceable? (Levels D, E)	Yes	No	N/A
	ogates expired? (Levels D, E)	F-3		
MS/	MSD samples analyzed?	<u></u>	No	NA
MS/	MSD results acceptable?	<u>@</u>	No	N/A
MS/	MSD standards NIST traceable? (Levels D, E)	Yes	No	
MS/	MSD standards? (Levels D, E)	Yes	No	NA
LCS	VBSS samples analyzed?		No	N/A
LCS	/BSS results acceptable?	Ŷ	No	N/A
Stan	dards traceable? (Levels D, E)	Yes	No	NIA
	dards expired? (Levels D, E)			
Tran	sscription/calculation errors? (Levels D, E)	Yes	No	NA
Perf	ormance audit sample(s) analyzed?	Yes	No	N/A
	formance audit sample results acceptable?			
	nments:			
				
				

5. PRECISION (Levels C, D, and E)		
MS/MSD samples analyzed?	Yes No	N/A
MS/MSD RPD values acceptable?		N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No	N/A
MS/MSD standards expired? (Levels D, E)		7
Field duplicate RPD values acceptable?		\sim
Field split RPD values acceptable?		
Franscription/calculation errors? (Levels D, E)	· ·	_ \
Comments:		
SYSTEM PERFORMANCE (Levels D and E)		
internal standards analyzed?	Yes No	N/A
(internal standard areas acceptable?		
Internal standard retention times acceptable?		
Standards traceable?		
Standards expired?		
Transcription/calculation errors?	the state of the s	
Comments:		
7. HOLDING TIMES (all levels)		
Samples properly preserved?	Yes No	N/A
Sample holding times acceptable?	***	N/A
Comments:		

	TION LIMITS (all levels)
Compound identification acceptable? (Levels D, E)	Yes No N/A
Compound quantitation acceptable? (Levels D, E)	
Results reported for all requested analyses?	YES NO NA
Rresults supported in the raw data? (Levels D, E)	Yes No N/A
Samples properly prepared? (Levels D, E)	
Laboratory properly identified and coded all TIC? (Levels D, E)	Yes No N/A
Detection limits meet RDL?	
Transcription/calculation errors? (Levels D, E)	
Comments: 12 aver	
9. SAMPLE CLEANUP (Levels D and E)	
GPC cleanup performed?	į.
GPC check performed?	Yes No N/A
	· ·
GPC check recoveries aceptable?	Yes No N/A
GPC check recoveries aceptable? GPC calibration performed?	Yes No N/A
	Yes No N/A
GPC calibration performed?	Yes No N/A Yes No N/A Yes No N/A
GPC calibration performed? GPC calibration check performed?	Yes No N/A Yes No N/A Yes No N/A Yes No N/A
GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable?	Yes No N/A
GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable?	Yes No N/A
GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired?	Yes No N/A
GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired? Analytical batch QC given similar cleanup?	Yes No N/A
GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired? Analytical batch QC given similar cleanup? Transcription/Calculation Errors?	Yes No N/A
GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired? Analytical batch QC given similar cleanup? Transcription/Calculation Errors?	Yes No N/A
GPC calibration performed? GPC calibration check performed? GPC calibration check retention times acceptable? Check/calibration materials traceable? Check/calibration materials Expired? Analytical batch QC given similar cleanup? Transcription/Calculation Errors?	Yes No N/A

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757

Matrix: SOLID

Test: VOA Ground Water Protection

SAF Number: F03-006

Sample Date: 05/30/03 Receive Date: 06/03/03

	•					2210. 00,0	.5,05
QC Type	Analyte	CAS#	Results	Units	Analysis Date	Lower Limit	Upper Limit
							
Lab ID	: W030000532						
	I QC ASSOCIATED WITH	H SAMPLE					
MS	1,1-Dichloroethene	75-35-4	112.000	% Recov	06/12/03	63,000	-117.000 -1
MS	Benzene	71-43-2	108.000	% Recov	06/12/03	75.000	129.000
MS	4-Bromofluorobenzene Surr	460-00-4	94.000	% Recov	06/12/03	84,000	116.000
MS	Chlorobenzene	108-90-7	108.000	% Recov	06/12/03	79.000	119.000
MS	1,2-Dichloroethane-d4 Surr	17060-07-0	96.000		06/12/03	82.000	136.000
MS	Toluene-d8 Surr	2037-26-5	100.000		06/12/03	89.000	119.000
MS MS	Toluena Trichloroethene	108-88-3 79-01-6	108.000 108.000		06/12/03 06/12/03	76.000	120,000
MSD	1,1-Dichloroethene	75-35-4	106.000		06/12/03	73.000 63.000	123.000 117.000
MSD	Benzene	71-43-2	106.000	200	06/12/03	75.000	129.000
MŠĎ	4-Bromofluorobenzene Surr	460-00-4	94.000	% Recov	06/12/03	84.000	116.000
MSD	Chlorobenzene	108-90-7	108.000	% Recov	06/12/03	79.000	119.000
MSD	1,2-Dichloroethane-d4 Surr	17060-07-0	94,000	% Recov	06/12/03	82.000	136.000
MSD	Toluene-d8 Surr	2037-26-5	100,000	% Recov	06/12/03	89.000	119.000
MSD	Toluene	108-88-3	106.000		06/12/03	76.000	120,000
MSD	Trichloroethene	79-01-6	104.000		06/12/03	73.000	123.000
SPK-RPD SPK-RPD	1,1-Dichloroethene	75-35-4 71-43-2	5.505	RPD :	06/12/03	0.000	25.000
SPK-RPD	Benzene 4-Bromofluorobenzene Surr	460-00-4	1.869 0.000	RPD RPD	06/12/03 06/12/03	0.000 0.000	25.000 25.000
SPK-APD	Chlorobenzene	108-90-7	0.000	RPD	06/12/03	0.000	25.000
SPK-RPD	1,2-Dichlorpethane-d4 Surr	17060-07-0	2.105	RPD	06/12/03	0.000	25.00Q
SPK-RPD	Toluene-d8 Surr	2037-26-5	0.000	RPD	06/12/03	0.000	25.000
SPK-RPD	Toluene	108-88-3	1 869	RPD	06/12/03	0.000	25,000
SPK-RPD	Trichloroethene	79-01-6	3.774	RPD	06/12/03	0.000	25.000
SURR	4-Bromofluorobenzehe Surr	460-00-4	94,000	% Recov	06/12/03	71.000	125,000
SURR	1,2-Dichloroethane-d4 Surr	17060-07-0 2037-26-5	97.000 100.000		06/12/03 06/12/03	80.000 80.000	134.000 126.000
SURFI	Toluene-d8 Surr	2037-20-0		76 NECOV	Oor1203. : 35.55	80,000	120.000
Lab ID:	W030000533	•					
	QC ASSOCIATED WITH	I SAMPLE					
SURR	4-Bromofluoropenzene Surr	460-00-4	87.000	% Recov	06/12/03	71.000	125.000
SURR	1,2-Dichloroethane-d4 Surr	17060-07-0	98.000	% Recov	06/12/03	80.000	134.000
SURR	Toluene-d8 Surr	2037-26-5	100.000	% Recov	06/12/03	80,000	126.000
ים איני							·
BATCH	-	75 24 2	- 10	alYa	06/12/03		
BLANK	1,1-Dichloroethane 1,1,1-Trichloroethane	75-34-3 71-55-6	< 1.0 ∴ ≲ 1.0	ug/Kg ug/Kg	06/12/03		
BLANK	1.1.2-Trichloroethane	79-00-5	< 1.0	ug/Kg	06/12/03	- 300 yr 20 8 9 0 200 20 0 00	
BLANK	1;1,2,2-Tetrachloroethane	79-34-5	< 1.0	ug/Kģ	06/12/03		
BLANK	1,1-Dichloroethene	75-35-4	· < 1.0	ug/Kg	06/12/03		Section of the sectio
BLANK	1,2-Dichloroethane	107-06-2	ૂ< 1.0	ug/Kg	06/12/03		
BLANK	1,2-Dichloroethene (cis & tran	540-59-0	< 1.0	ug/Kg	06/12/03		•
					· · · · · · · · · · · · · · · · · · ·		

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WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20030757

Matrix: SOLID

Test: VOA Ground Water Protection

SAF Number: F03-006 Sample Date: Receive Date:

QC Type	Analyte	CAS#	Results	Units	Analysis	Lower	Upper
BLANK	2-Hexanone	591-78-6	< 1.0	ug/Kg	Date 06/12/03	Limit	Limit
BLANK	4-Methyl-2-pentanona	108-10-1	< 1.0	ug/Kg ug/Kg	06/12/03 06/12/03		
BLANK	Acetona	67-64-1	< 1.0	ug/Kg	06/12/03		
BLANK	Bromodichloromethane	75-27-4	< 1.0	ug/Kg	06/12/03	10 11.84S	
BLANK	Benzene	71-43-2	< 1.0	ug/Kg	06/12/03	Tabaa s s	
BLANK	4-Bromofluorobenzene Surr	460-00-4	96.000	% Recov	06/12/03	71.000	125.000
BLANK	Bramoform	75-25-2	< 1.0	ug/Kg	06/12/03	V. 700	
BLANK	Carbon Disulfide	75-15-0	< 1,0	ug/Kg	06/12/03	s - 20 pt - 2020/200	
BLANK	Carbon Tetrachloride	56-23-5	< 1.0	ug/Kg	06/12/03		
BLANK	Dibromochloromethane	124-48-1	< 1.0	ug/Kg	06/12/03	F. C. 1995 - A. A. M. A. M. C. 1995	******************************
BLANK	Chloraform	67-66-3	< 1.0	ug/Kg	06/12/03	10.48	
BLANK	Chlorobenzene	108-90-7	< 1.0	ug/Kg	06/12/03	11. St. Wall to charge of	M. Vineschanden a. despendente en
BLANK	cis-1,3-Dichlorapropens	10061-01-5	< 1.0	ug/Kg	06/12/03		
BLANK	Chloroethane	75-00-3	< 1.0	ug/Kg	06/12/03		40-10000000 <u>2010-0042-004</u> 00000000000000000000000000000
BLANK	1,2-Dichloroethane-d4-Surr	17060-07-0	104.000	% Recov	and the state of the second	80.000	134.000
BLANK BLANK	1,2-Dichloropropane	78-87-5 100-41-4	< 1.0 . < 1.0	ug/Kg	06/12/03 06/12/03	-75-85 III G8888	Kur Arasanas atamatan (1977)
BLANK	Ethylbenzene Bromomethane	74-83-9	< 1.0	ug/Kg ug/Kg	06/12/03	4400	
BLANK	Chloromethane	74-87-3	< 1.0	ug/Kg	06/12/03	- 47.79.89.89	
BLANK	2-Butanone	78-93-3	< 1.0	ug/Kg	06/12/03	12 (28)(11)	
BLANK	Methylene Chloride	75-09-2	< 1.0	ug/Kg	06/12/03	. Nervis	
BLANK	Tetrachloroethene	127-18-4	< 1.0	ug/Kg	06/12/03	4 1,404 MT 6 1	
BLANK	Styrene	100-42-5	< 1.0	ug/Kg	06/12/03	2 9-30 (12-11) (6 V21 (11-14-16)	**************************************
BLANK	Total Xylenes	1330-20-7	< 1.0	ug/Kg	06/12/03	0.000	300.000
BLANK	Toluene-d8 Surr	2037-26-5	100.000	% Recov	06/12/03	80,000	128.000
BLANK	Toluene	108-88-3	< 1.0	ug/Kg	06/12/03		and a superior of the superior
BLANK	trans-1,3-Dichloropropena	10061-02-6	< 1,0 ⇒	ug/Kg	06/12/03		
BLANK	Trichloroethene	79-01-6	< 1.0	ug/Kg	06/12/03	₹ 1, 67000 (.400 8 .40)	
BLANK	Vinyl Chloride	75-01-4	< 1.0	ug/Kg	06/12/03		400.000
LCS	1,1-Dichloroethene	75-35-4	98.000	% Recov	06/12/03	70.000 70.000	130.000 130.000
LCS	Benzens	71-43-2 460-00-4	106.000 96.000	% Recov	1,000 (2000)	71.000	125.000
LCS LCS	4-Bromofluorobenzena Surr Chlorobenzena	108-90-7	106.000		06/12/03	70.000	130,000
LCS	1,2-Dichloroethane-d4 Surr	17060-07-0	100.000		06/12/03	80.000	134.000
LCS	Toluene-d& Surr	2037-28-5	100,000		06/12/03	80.000	126,000
LCS	Toluene	108-88-3	108.000		06/12/03	70.000	130.000
LCS	Trichloroethene	79-01-8	104.000		06/12/03	70.000	130.000
		1 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	* V			A LI ASTRONI CASSAGA	000010000000000000000000000000000000000

Date:

17 November 2003

To:

Fluor Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

200-PW-2/200-PW-4 OU - Borehole Soil Sampling

Subject: Wet Chemistry - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 30757 prepared by WSCF. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B171B9	5/30/03	Soil	С	See note 1 & 2

- 1 Ammonia 350.3; pH 9040A; IC anions 300.0; cyanide 9010B.
- 2 Phosphate, nitrate and nitrite not validated per FHI request.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev.1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

Holding Times/Sample Preservation

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for ammonia, chloride, fluoride and sulfate; 14 days for cyanide; 2 days for phosphate; and immediate (24 hours) for pH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged 0000**01**



"J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J".

All other holding times were acceptable.

Method Blanks

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

Accuracy

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike and LCS recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All matrix spike and LCS recovery results were acceptable.

Precision

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. All results met the TQL.

Completeness

Data package No. 30459 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

FHI, Contract #20266, Validation Statement of Work, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan, December 2000.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with FHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE_1_OF_1_			
COMMENTS:						
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON			
рН	J	All	Holding time			

Qualified Data Summary and Annotated Laboratory Reports

Project: FLUOR-HA	ANFORD			1			•								
Laboratory: WSCF				1											
Case		VSCF20030	757	1											
Sample Number		B171B9													
Remarks	_														
Location										1				1	
Sample Date		5/30/03													
Wet Chemistry	TQL	Result	a	Result	Q	Result	q	Result	Q	Result	Q	Result	Q	Result	Q
Ammonia	0.5	253				·		ļ						l	<u>L</u>
Cyanide	0.5	<0.200	U			į		•							
рH		8.42	J					l							
Bromide		<22.5	U												
Chioride	2								L						
Fluoride	5	<3.50	U			j		ļ				<u> </u>		I	
Nitrate*	2.5	165										<u> </u>	l		
Nitrite*	2.5	<4.50	U												
Phosphate*	5	<6.50	U	<u> </u>											
Sulfate	5	647		<u> </u>											
													l		
				l				·			·			L	
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WSCF ANALYTICAL RESULTS REPORT

Attention: Project:

Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

					WSCF						
Sample #	Client ID	CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample Receive
W030000532	B171CO GPP TRENT	75-01-4	Vinyl Chloride	SOLID	LA-523-455	U	< 20.0	ug/kg	1,00	20	06/12/03 05/30/03 06/03/03
W030000532	B171CO GPP TRENT	10061-01-5	cis-1,3-Dichloropropens	SOLID	LA-523-455	U	< 20.0	ug/kg	1.00	20	06/12/03 05/30/03 06/03/03
W030000532	B171CO GPP TRENT	10061-02-6	trans-1,3-Dichloropropene	SOLID	LA-523-455	Ü	< 20.0	ug/kg	1.00	20	06/12/03 05/30/03 06/03/03
W030000532	B171CO GPP TRENT	TPHKEROSENE	Kerosene	SOLID	NWTPH	dalah dagam U	< 1.50a+04	ug/kg	1.00	1.5e+04	06/12/03 05/30/03 06/03/03
W030000532	8171CO GPP TRENT	68476-34-6	Total Pet. Hydrocarbons Diesel	SOLID	NWTPH	Ü	< 1.50e+04	ug/kg	1.00	1.5e+04	06/12/03 05/30/03 06/03/03
W030000532	B171CO GPP TRENT	84-15-1	ortho-Terphenyl	SOLID	NWTPH	Autor din die die	9.10a+04	ug/kg	1.00	2.0e+03	06/12/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	7.664-41-7	Ammonia (N) by IC	SOLID	LA-503-401		253	ug/g	5.00e+002	2.0	06/09/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	57-12-5	Cyanide by Midi/Spectrophotom	SOLID	LA-695-402	Maria de Ari M	< 0.200	mg/kg	AAN MININGATE OF TO A	0.20	06/12/03 05/30/03 06/03/03
W030000533	817189 GPP TRENT	TS	Percent Solids	SOLID	LA-519-412		96,2 🗘		en de la	0.0	06/12/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	PH	pH Soil and Waste Measurement	SOUD	LA-212-411	$\boldsymbol{\mathcal{I}}$	8.42			0.010	06/11/03 05/30/03 06/03/03
WQ30000533	B17189 GPP TRENT	14596-10-2	Am-241 by AEA	SOLID	LA-508-471		2.00	Vigo -		0.32	06/17/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Am-241 by AEA Total Cntg Error	SOLID	LA-508-471	oktěm napědamě 1 a	24.0	% ***	4 14,03 (17)	0.0	06/17/03 05/30/03 06/03/03
-w030000533	817189 GPP TRENT	24959-67-9	Bromide (Br) by IC	SOLID	LA-533-410	Ų .	< 22.5	ug/g	5,00e+002	22	06/10/03 05/30/03 06/03/03
W030000533	B17189 GPP TRENT	16887-00-6	Chloride (CI) by IC	SOLID	LA-533-410	144	12.4	ug/g	5.00e+002	7.0	06/10/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	16984-48-8	Fluoride (F) by IC	SOLID	LA-533-410	U	< 3.50	ug/g	5.00e+002	3.5	06/10/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	NO3-N	Nitrate (N) by IC	SOLID	LA-533-410		165	ug/g	5.00e+002	2.5	06/10/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	NO2-N	Nitrite (N) by IC	SOLID	LA-533-410	عدر ∪	< 4.50	ug/g	5.00e+002	4.5	06/10/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	14265-44-2	Phosphate (P) by IC	SOLID	LA-533-410	U 173	< 6.50	ug/g	5.00e+002	6.5	06/10/03 05/30/03 06/03/03
- W030000533	B171B9 GPP TRENT	14808-79-8	Sulfate (SO4) by IC	SOLID	LA-533-410	13/11	647	ug/g	5.00e+002	12	06/10/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Ac-228 Rel.% Count Error (GEA)	SOLID	LA-508-462	7.7-	133	%	VI (2. d. 1997) 44	0.0	06/13/03 05/30/03 06/03/03
W030000533	817189 GPP TAENT	14331-83-0	Ac-228 by GEA	SOLID	LA-508-462	U	-18.6	pCi/g		41	06/13/03 05/30/03 06/03/03
	B171B9 GPP TRENT	E,T,C	Am-241 Rel.% Count Error (GEA)	SOLID	LA-508-462	eti es tisk it ya s	308	%		0.0	06/13/03 05/30/03 06/03/03
→ W030000533	B171B9 GPP TRENT	14596-10-2	Am-241 by GEA	SOLID	LA-508-462	U .	-17.8	pCi/g	salathal kali Jak	92	06/13/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Bi-212 Rel.% Count Error (GEA)	SOLID	LA-508-462	AUT AUT TO FE THE	887	%	54 80 08 00h 19 s	0.0	06/13/03 05/30/03 06/03/03
→ wo3oooo533	B17189 GPP TRENT	14913-49-6	Bi-212 by GEA	SOLID	LA-508-462	U ·	·7.87	pCi/q	eago es	1,2e+02	06/13/03 05/30/03 06/03/03
W030000533	B171B9 GPP TRENT	E,T,C	Bi-214 Rel.% Count Error (GEA)	SOLID	LA-508-462	anannii saa ilinii	1.00e+03	%	eurerbeign i Tigori	0.0	06/13/03 05/30/03 06/03/03
₩030000533	817189 GPP TRENT	14733-03-0	Bi-214 by GEA	SOLID	LA-508-462	Ú.	-1.75	pCi/g		34	06/13/03 05/30/03 06/03/03

MDL=Minimum Detection Limit RQ=Result Qualifier

E - Analyte is an estimate, has potentially larger errors

U - Analyzed for but not detected above limiting criteria.

J - Estimated Value



• - Indicates results that have NOT been validated;

Report W004/ver. 5.1

Ground Water Protection Program

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	WSCF20030757				
Sample Matrix	Soil				
Sample Visual	Brown				
SAF Number	F03-006				
Data Deliverable	Summary Report				

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the Groundwater Protection Program-Letter of Instruction, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work was performed with no deviations to the approved procedure for Ammonium, but a deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.
- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.
- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laborator Analytical Manager and Client Services, as verified by the following signature.

Troy Dale

WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline

Am - americium
Cm - curium
Pu - plutonium
Np - neptunium
GEA - gamma energy analysis
H3 - Tritium
Sr - Strontium 89, 90
WTPH-D - Total Hydrocarbons-Diesel
TSS - Total Suspended Solids

FH-Central Plateau Project	CI	HAIN OF CUST	ODY/S	AMPL	E ANALY	SIS	REQUES	T	F03-	006-144	Page I	of]
Collector Johansen/Pope/Pfister	Compa	any Contact Hulstrom		ne No.		; š 2.	Project Coord		Price Code	8N	Data Tur	naround
Project Designation 200-PW-2/200-PW-4 OU - Borchole Soil Sampling	Sampl 216	ing Location and 6-2 -B-12 (C3246); (32'-35')	29-03 30-3	3.5 (÷	35.5-38	<u>'</u>)	SAF No. F03-006				Days	
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	-	Preservation	Cool 4C	Cool 4C	None	Nor	•	1				<u> </u>
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B17189 W0 30005373 SOIL F	7-55-1	23/1140	<u> </u>	<u> </u>					BITIFL			
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	Sign/Print eived By/Stor		ate/Time		ECIAL INSTR			1 P 1	-1-6	*******		Matrix *
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Relinquished By/Removed From Date/Time /4/00 Reco	civica By/Star	ed In. ()D	ate/Time	1480 (stonium; Americiu atimony, Arsenic,	m-241; I Barium	Isotopic Uranium; Beryllium, Cadm	Total Urani um, Chrom	un; ICP Metals - 66 ium, Copper, Nicke) 10A (SW-840 L, Silver) ; ICP	i) Metals -	A=Air DS=Drum Solids
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FINAL SAMPLE Disposal Method DISPOSITION					Dispo	sed By	<u>и</u>			- ,	Date/Time	

BHI-EE-011 (03/01/2002)

#1-200.8 & 6010 /man 06-05-03

Appendix 5

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	В	(c)	D	E
PROJECT: 200	-DM-5 500-	PW-4	DATA PACKAG	030757	
VALIDATOR:	tu '	LAB: WSCF	•		8/00
CASE:			SDG: WSCF	20030757	
		ANALYSES	PERFORMED	,	
Anions/IC	тос	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	OH	NO ₃ /NO ₂
Sulfate	TDS	TKN	Phosphate (Example)	
				V	
SAMPLES/MAT	RIX				
Bhi	37				
					
					50,1
1. DATA PA	ACKAGE COMPL	ETENESS AND C	ASE NARRATIV	E	
	ion documentation p	resent?) > 7 h e z é býd à 2 h e n a a 4 e v v o 4 a 5 4 e e e e	Yes No N/A
Comments:		· · · · · · · · · · · · · · · · · · ·	····-		
					·
<u> </u>				······································	
2. INSTRUM	MENT PERFORM	ANCE AND CAL	TREATIONS (I ave	ole Th and Fh	\sim
	performed on all ins		•	•	Yes No N/A
					Yes No N/A
					Yes No N/A
					Yes No N/A
					Yes No N/A
					Yes No N/A
				***********************	Yes No N/A
Comments:			· · · · · · · · · · · · · · · · · · ·		
					

3. BLANKS (Levels B, C, D, and E)	
ICB and CCB checks performed for all applicable analyses? (Levels D, E)	Yes No NA
ICB and CCB results acceptable? (Levels D, E)	//~/
Laboratory blanks analyzed?	
Laboratory blank results acceptable?	· /
Field blanks analyzed? (Levels C, D, E)	
Field blank results acceptable? (Levels C, D, E)	
Transcription/calculation errors? (Levels D, E)	_
Comments:	
4. ACCURACY (Levels C, D, and E) Spike samples analyzed?	(2) Kolad
Spike recoveries acceptable?	
Sike standards NIST traceable? (Levels D, E)	
Spike standards expired? (Levels D, E)	>≤ 1
LCS/BSS samples analyzed?	
LCS/BSS results acceptable?	
Standards traceable? (Levels D, E)	_
Standards expired? (Levels D, E)	7 1
Transcription/calculation errors? (Levels D, E)	
Performance audit sample(s) analyzed?	//
Performance audit sample results acceptable? Comments: 10 10 10 10 10 10 10 10 10 10 10 10 10	Yes No W
HO LCS KNOW - 57 19/8	≥
	NO DAS

5.	PRECISION (Levels C, D, and E)					`	
Dupli	icate RPD values acceptable?	1444 P64845 0024244 224440 2354	. 3 = 94 7 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9	*****************************	Yes	No	N/A
	icate results acceptable?					No	N/A
	ASD standards NIST traceable? (Levels I				Yes	No	NA
	ASD standards expired? (Levels D, E)					,	\sim
	duplicate RPD values acceptable?						
	split RPD values acceptable?						\mathbf{x}
	scription/calculation errors? (Levels D, E						\sim
	ments:						
						_ \	
		·····					
			· <u> </u>				
6.	HOLDING TIMES (all levels)				<i>(</i> 2)		
Samp	les properly preserved?		**************	***************	Yes	No	N/A
	ele holding times acceptable?				Yes(No)	N/A
	neuts:	A 4	> 2 ×	Tall			
		Phane	4 73 x	12R/	12/10/	_	
					,		
							
						· · · · ·	
							

7. RESULT QU	ANTITATION AND DET	ECTION LIMITS (all leve	els)	
Results reported for all	requested analyses?		v * * * * * * * * * * * * * * * * * * *	Yes No N/A
	he raw data? (Levels D, E)			· / /
	ared? (Levels D, E)			
A second	WL?			
	on errors? (Levels D, E)			() A
Comments:	Kerosely	2 TRH-Dred	TYPEGAN	de over
		10/18/07	19(8/2)	
<u> </u>	· · · · · · · · · · · · · · · · · · ·			

Appendix 6

Additional Documentation Requested by Client

SDG Number: WSCF20030757

Matrix: SOLID

Test: Anions by Ion Chromatography

SAF Number: F03-006

Sample Date: 06/03/03 Receive Date: 06/03/03

QC Type	Analyte	CAS#	Results	Units	Analysis Date	Lower Limit	Upper
-38-		0.10 //	Results	Onto	Date	Liuit	Limit
Lab ID:	: W030000530			•	•		
	I QC ASSOCIATED W	ITH SAMPLE					
OUP	Bromide (Br) by IC	24959-67-9	0/4	RPD	06/09/03	0.000	20,000
DUP	Chloride (CI) by IC	16887-00-6	n/a	APD	06/09/03	0.000	20.000
DUP	Fluoride (F) by IC	16984-48-8	n/e	RPD	06/09/03	0.000	20,000
DUP .	Nitrite (N) by (C Nitrate (N) by (C	NO2-N NO3-N	n/a	APD BAC	06/09/03	0.000	20.000
DUP	Phosphate (P) by IC	14265-44-2	8,889 n/a	RPD RPD	06/09/03 06/09/03	0.000 0.000	20.000 20.000
DUP	Sulfate (SO4) by IC	14808-79-8	1.592	RPD	06/09/03	0.000	20.000
MS	Bromide (Br) by IC	24959-67-9	94.975	% Recov	06/10/03	75.000	125.000
MS	Chloride (CI) by IC	18887-00-8	99.697	access recessors and as proceeds.	06/10/03	75.00Q	125.000
MS MS	Fluoride (F) by IC Nitrite (N) by IC	16984-48-8 NO2-N	101.636 93:056	% Recov	06/10/03 06/10/03	75.000 75.000	125.000 125.000
MS	· Nitrate (N) by IC	NO3-N	93.049	state from the state of the sta	06/10/03	75.000	125.000
MS	Phosphate (P) by IC	14265-44-2	93.535	% Recov	06/10/03	75,000	125.000
MS	Sulfate (SO4) by IC	14808-79-8	98.447		06/10/03	75.000	125.000°
MSD MSD	Bromide (Br) by IC Chloride (Cl) by IC	24959-67-9 16887-00-6	100,503 109,091	79779 + +000000 N. J. 100	08/10/03 06/10/03	75.000 75.000	125.000 125.000
MSD	Fluoride (F) by IC	18984-48-8	108,793		06/10/03	75.000 75.000	125,000
MSD	Nitrite (N) by IC	NO2-N	98.016	% Recov	, 290 meserce en	75.000	125.000
MSD	Nitrate (N) by IC	NO3-N	100.224		06/10/03	75,900	125,000
MSD MSD	Phosphate (P) by IC Sulfate (SO4) by IC	14265-44-2 14808-79-8	100.104 103.046	an Commission of the	06/10/03 06/10/03	75.000 75,000	125.000
		7,000	103.040	Visit in the contract of the c	00/10/04	70,000	125.000
BATCH	QC						
BLANK	Bromide (Br) by IC	24959-67-9	<4.50e-2	mg/L	06/09/03	0.000	300.000
BLANK	Bramide (Br) by IC	24959-67-9	<4,50a-2	mg/L	06/10/03	0,000	300.000
BLANK BLANK	Chloride (CI) by IC Chloride (CI) by IC	16887-00-6 16887-00-6	<1,40e-2 <1,40e-2	mg/L mg/L	06/09/03 06/10/03	0.000	300.000 300.000
BLANK	Fluoride (F) by IC	16984-48-8	<7.00e-3	mg/L	06/09/03	0.000	300.000
BLANK	Fluoride (F) by IC	16984-48-8	<7.00 4 -3	mg/L	06/10/03	0.000	300,000
BLANK	Nitrite (N) by IC	NO2-N	<9,00e-3	mg/L	06/09/03	0.000	300.000
BLANK BLANK	Nitrite (N) by IC Nitrate (N) by IC	NO2-N NO3-N	<8.00e-3 <5.00e-3	mg/L mg/L	06/10/03 06/09/03	0.000	300,000 300,000
BLANK	Nitrate (N) by IC	N-EON	<5.00e-3	mg/L	06/10/03	0.000	300.000
BLANK	Phosphate (P) by IC	14265-44-2	<1.30e-2	mg/L	06/09/03	0.000	300.000
BLANK	Phosphate (P) by IC	14285-44-2	<1.30a-2	mg/L	06/10/03	0.000	308.000
BLANK	Sulfate (504) by IC	14808-79-8	< 2.40e-2	mg/L	06/09/03	0.000	300.000
BLANK LCS	Sulfate (SO4) by IC Bromide (Br) by IC	14808-79-8 24959-67-9	<2.40e-2 100.249	mg/L % Recov	06/10/03 06/09/03	0,000 80.000	300.000 120.000
LCS	Chloride (Cl) by IC	16887-00-6	98,500		08/09/03	80.000	120,000
LCS	Fluoride (F) by IC	16984-48-8	106.383	dement i filosofi ett til i filosofi ett til e	06/09/03	80.000	120.000
LCS	Nitrite (N) by IC	NO2-N	96,078	. (6/100000) (4/10/14/16/14/16/14	06/09/03	80.000	120.000
LCS	Nitrate (N) by IC	NO3-N	99.556	% Recov	06/09/03	80.000	120.000

Report w13q/rev.5.1 p 2 7-jul-2003 07:17:16

SDG Number: WSCF20030757 Matrix: SOLID

Test: Anions by Ion Chromatography

SAF Number: F03-006

Sample Date: Receive Date:

QC Type	Analyte	CAS#	Results	Units	Analysis Date	Lower Limit	Upper Limit	
LCS	Phosphate (P) by IC	14265-44-2	102,167	% Recov	06/09/03	80,000	120,000	
LCS	Sulfate (SO4) by IC	14808-79-8	103.008	% Recov	06/09/03	80,000	120,000	

Report w13q/rev.5.1 p 3 7-jul-2003

SDG Number: WSCF20030757

Matrix: SOLID

Test: Ammonia (N) by IC

SAF Number: F03-006

Sample Date: 06/03/03 Receive Date: 06/03/03

QC Type

Analyte

CAS# Results Units

Analysis Date

Lower Limit Upper Limit

Lab ID:

W030000530

BATCH QC ASSOCIATED WITH SAMPLE

Ammonia (N) by tC MS Ammonia (N) by IC MSD Ammonia (N) by IC

7864-41-7 7664-41-7 7684-41-7

8,943 81.212 83.636

RPD :: 06/09/03 06/09/03 06/09/03

0.000 75.000 75.000

20.000 125,000 125.000

BATCH QC

LCS

BLNK-PREP Ammonia (N) by IC BLNK-PREP Ammonia (N) by IC

Ammonia (N) by IC

7664-41-7 7684-41-7 7664-41-7

< 4.00e-3 < 4.00e-3 98.673

06/09/03 Ratio Ratio 06/09/03 % Recov 06/09/03

80.000

120.000

SDG Number: WSCF20030757

Matrix: SOLID

Test: Cyanide by Midi/Spectrophotom

SAF Number: F03-006

Sample Date: Receive Date: 06/03/03

75.000

06/03/03

125,000

QC					Analysis	Lower	Upper
Туре	Analyte	CAS#	Results	Units	Date	Limit	Limit

Lab ID: W030000530

MS Cyanide by Midi/Spectrophotom

BATCH QC ASSOCIATED WITH SAMPLE

MSD	Cyanide by	Midi/Spectropho	tom 67-12-5	100.100) % Reco	v 06/12/03	75.000	125.000	5,3
SPK-PPD	Cyanida by	Midi/Spectropho	tom 57-12-5	0.994	RPD	08/12/03	0.600	20.000	***
BATCH	QC								
BLANK	Cyanide by	Midi/Spectropho	tom 57-12-5	1,072	ug/L	06/12/03	-4.000	4.000	
BLNK-PREP	Cyanide by	Midi/Spectropho	tom 57-12-5	:: 1,836	ùg/L	06/12/03	-4.000	4.000	100
DUP	Cyanida by	Midi/Spectrophor	tom 57-12-5	n/a	RPD	06/12/03	0.000	20.000	6.56
LCS	Cyanida by	Midi/Spectrophor	am 57-12-5	89.310	% Reco	v 06/12/03	85.00Q	115,000	501 883
LCS-2	Cyanide by	Midi/Spectrophot	om 57-12-5	n/a	% Reco	v 06/12/03	80.000	120.000	207

101,100

% Recov 06/12/03

1

Date:

17 November 2003

To:

Fluor Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

200-PW-2/200-PW-4 OU Borehole Soil Sampling

Subject:

Inorganics - Data Package No. WSCF20030757 (SDG No. 30757)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 30757 prepared by WSCF. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Levelnnnn	Analysis
B171B9	5/30/03	Soil	С	See note 1

1 - ICP metals by 6010A and 200.8.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

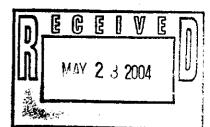
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

Holding Times

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals.

All holding times were acceptable.



Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

Accuracy

Matrix Spike & Laboratory Control Sample Analysis

Matrix spike (MS), matrix spike duplicate (MSD) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125% for matrix spike analysis. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required. LCS recoveries must fall within limits specified by the laboratory.

Due to an LCS recovery outside QC limits, all antimony (73.9%) results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits, all silver (5.3%) results were rejected and flagged "UR".

Due to the lack of a MS analysis, all aluminum results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (54.8%), all bismuth results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Precision

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike and matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than +/- 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to the lack of a duplicate analysis, all ICP-MS results were qualified as estimates and flagged "J".

Field Duplicate

No field duplicates were submitted for analysis.

Analytical Detection Limits

Reported analytical detection levels are compared against the target quantitation limits (TQLs) to ensure that laboratory detection levels meet the required criteria. The silver, lead and beryllium results exceeded the TQL. Under the BHI statement of work, no qualification is required. All other results met the analyte specific TQL.

Completeness

Data package No. 30757 was submitted for validation and verified for completeness.

Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 96%.

MAJOR DEFICIENCIES

Due to a matrix spike recovery outside QC limits, all silver (5.3%) results were rejected and flagged "UR". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to an LCS recovery outside QC limits, all antimony (73.9%) results were qualified as estimates and flagged "J". Due to the lack of a MS analysis, all aluminum results were qualified as estimates and flagged "J". Due to the lack of a matrix spike duplicate analysis, all ICP-MS results were qualified as estimates and flagged "J". Due to an LCS recovery outside QC limits (54.8%), all bismuth results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

FHI, Contract #20266, Validation Statement of Work, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2000-60, Rev. 1, 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with FHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY

SDG: 30757	REVIEWER: TLI	DATE: 11/17/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bismuth	J	All	LCS recovery
Antimony	J	All	LCS recovery
Aluminum	J	All	No MS analysis
Silver	UR	All	MS recovery
All	J	All	No duplicate analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: FLUOR	HANFOR	.D													
Laboratory: WS	CF														
Case	SDG: W	/SCF2003	3075	7											
Sample Number		B171B9													
Remarks															
Sample Date		5/30/03												"-	
Inorganics	TQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Bismuth		<4.41	UJ						<u></u>	<u> </u>				<u> </u>	
Boron		<4.500	U	ļ ⁻]				1						
Aluminum		6420	J		Ĺ.,				1						
Antimony	6	<2.36	UJ		Ϊ		}								
Arsenic	1	3.74	J		[
Barium	20	28.2	J		Ĺ										
Beryllium	0.5	<1.42	UJ												
Cadmium	0.5	<0.473	UJ						1						
Chromium	1	6,94	J		L.,		_								Ш
Cobalt		3,80	J									<u> </u>	1		Ш.
Соррег	2.5		J					.]		1					
Lead	1	<5.68	Π'n			<u> </u>	\perp			ļ		<u> </u>			$oldsymbol{oldsymbol{\perp}}$
Manganese		139			<u>L</u>				<u> </u>	ļ <u></u>	↓.	1	$oldsymbol{ol}}}}}}}}}}}}}}}}}$	1	\bot
Mercury	0.2							1	↓_	 	\bot	<u> </u>	Щ.	ļ <u> </u>	\bot
Molybdenum		<1.42	UJ	<u> </u>	<u> </u>		_		↓	<u> </u>	↓_	<u> </u>	<u> </u>		Щ.
Nickel	4	5.48	J		<u> L.</u>	<u> </u>		Ш		<u> </u>		1		1	

WSCF ANALYTICAL RESULTS REPORT

Attention: Project:

Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

						WSCF							
Sample #	Client ID		CAS#	Test Performed	Matrix	Method	RQ	Result	Unit	DF	MDL	Analyze Sample	Receive
W030000533	817189 GPP 1	RENT	13967-48-1	Ru-106 by GEA	SOLID	LA-508-462	U	24.9	pCi/g		1,6s+02	06/13/03 05/30/03	06/03/03
W030000533	B171B9 GPP 1	RENT	E,T,C	Sb-125 Rel.% Count Error (GEA)	SOLID	LA-508-462		871	%	THE PERSON NAMED IN COLUMN	0.0	06/13/03 05/30/03	06/03/03
W030000533	B171B9 GPP1	TRENT	14234-35-6	Sb-125 by GEA	SOLID	LA-508-462	U	5.19	pÇi/g		73	06/13/03 05/30/03	06/03/03
W030000533	B171B9 GPP 1	RENT	E,T,C	Sn-113 Rel.% Count Error (GEA)	SOLID	LA-508-462	-2-2-2-2-2-2-2	248	%		0.0	06/13/03 05/30/03	06/03/03
EE20000EOW	B17189 GPP 1	RENT	13966-06-8	Sn-113 by GEA	SOLID	LA-508-462	ij:	-7.50	pCi/g		30	06/13/03 05/30/03	06/03/03
W030000533	B17189 GPP 1	RENT	E,T,C	Sn-126 Rel.% Count Error (GEA)	SOLID	LA-508-462	atata atanatana	92.4	%		0.0	06/13/03 05/30/03	06/03/03
₩030000533	817189 GPF.1	RENT	15832-50-5	Sn-128 by GEA	SOLID	LA-508-462	U ·	25.1	pCi/g	排出出海	38	06/13/03 :05/30/03	06/03/03
wo30000533	B171B9 GPP 1	RENT	E,T,C	Th-234 Rel.% Count Error (GEA)	SOLID	LA-508-462		117	%		0.0	06/13/03 05/30/03	06/03/03
W030000533	B171B9 GPP 1	RENT	15065-10-8	Th-234 by GEA	SOLID	LA-508-462	Ü	-359	pCi/g		7,0e+02	06/13/03 05/30/03	06/03/03
W030000533	B171B9 GPP T	RENT	E,T,C	Ti-208 Rel.% Count Error (GEA)	SOLID	LA-508-462		268	%		0.0	06/13/03 05/30/03	06/03/03
W03000533	B17189 GPP 1	RENT	14913-50-9	TI-208 by GEA	SOLID	LA-508-462	U.	4.07	pCi/g		18	06/13/03 05/30/03	06/03/03
W030000533	B171B9 GPP T	RENT	E,T,C	U-235 Rel.% Count Error (GEA)	SOLID	LA-508-462		289	%		0.0	06/13/03 05/30/03	06/03/03
W030000533	B171B9 GPP 1	RENT	15117-96-1	U-235 by GEA	SOLID	LA-508-462	U	24.0	pCi/g		1.2e+02	06/13/03 05/30/03	06/03/03
W030000533	B171B9 GPP 1	RENT	E,T,C	Zn-65 Rel.% Count Error (GEA)	SOLID	LA-508-462		92.6	%		0.0	06/13/03 05/30/03	06/03/03
W030000533	B171B9 GPP T	RENT	13982-39-3	Zn-65 by GEA	SOLID	LA-508-462	U	14.0	pÇi/g		21	06/13/03 05/30/03	06/03/03
W030000533	B17189 GPP T	•	7440-69-9	Bismuth by ICP	SOLID	LA-505-411	UI	< 4.41	ug/g	44.14	4.4	06/25/03 05/30/03	06/03/03
W030000533	B171B9 GPP T	RENT 7440-42.	7440 50.8.	Boron by ICP	SOLID	LA-505-411	U	< 4.500	ug/g	44.14	4.502	06/25/03 05/30/03	06/03/03
W030000533		RENT Nayre	V	Aluminum by ICP-MS	SOLID	LA-505-412	E J	6.42e+0	3 ug/g	4.73	52	06/18/03 05/30/03	06/03/03
W030000533	B17189 GPP.T	RENT KILLO	7440-36-0	Antimony by ICP-MS	SOLID	LA-505-412	U J.	< 2.36	ug/g	4.73	2,4	06/18/03 05/30/03	06/03/03
W030000533	817189 GPP 1	RENT 7	7440-38-2	Arsenic by ICP-MS	SOLID	LA-505-412	J	3.74	ug/g	4.73	1.4	06/18/03 05/30/03	06/03/03
W030000533	B171B9 GPP T	RENT	7440-39-3	Barium by ICP-MS	SOLID	LA-505-412	1	28,2	ug/g	4,73	0.95	06/18/03 05/30/03	06/03/03
W030000533	B171B9 GPP T	RENT	7440-41-7	Beryllium by ICP-MS	SOLID	LA-505-412	ロマ	< 1.42	ug/g	4.73	1.4	06/18/03 05/30/03	06/03/03
W030000533	B171B9 GPP 1	RENT	7440-43-9	Cadmium by ICP-MS	SOLID	LA-505-412	U ~	< 0.473	ug/g	4.73	0.47	06/18/03 05/30/03	06/03/03
W030000533	B171B9 GPP T	RENT	7440-47-3	Chromium by ICP-MS	SOLID	LA-505-412	す	6.94	ug/g	4.73	1.4	06/18/03 05/30/03	06/03/03
W030000533	817189 GPP T	RENT	7440-48-4	Cobalt by ICP-MS	SOLID	LA-505-412	7	3,80	ug/g	4,73	0.95	06/18/03 05/30/03	06/03/03
W030000533	B171B9 GPP T	RENT	7440-50-8	Copper by ICP-MS	SOLID	LA-505-412	I	5.92	ug/g	4.73	2.4	06/18/03 05/30/03	06/03/03
WQ30000533	B17189 GPP T	RENT	7439-92-1	Lead by ICP-MS	SOLID	LA-505-412	u J	< 5.68	ug/g	4.73	5.7	06/18/03 05/30/03	06/03/03

MDL=Minimum Detection Limit

E - Analyte is an estimate, has potentially larger errors

RQ=Result Qualifier

U - Analyzed for but not detected above limiting criteria.

J - Estimated Value

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols Report W004/ver. 5.1

Ground Water Protection Program



WSCF ANALYTICAL RESULTS REPORT

Attention: Project: Steve Trent

F03-006: 200-PW-2/PW-4

Group #:

WSCF20030757

Sample #	Client II)	CAS#	Test Performed	Matrix	WSCF Method	RO	Result	Unit	DF	MDL	Analyze Sample	Receiv
W030000533		GPP TRENT	7439-96-5	Manganese by ICP-MS	SOLID	LA-505-412	T	139	Ug/g	4.73	14	06/18/03 05/30/03	
W030000533	B171B9	GPP TRENT	7439-97-6	Mercury by ICP-MS	SOLID	LA-505-412	7	1.31	ug/g	4.73	0.47	06/18/03 05/30/03	
W030000533	817189	GPP TRENT	7439-98-7	Molybdenum by ICP-MS	SOLID	LA-505-412	υ τ	¢ 1.42	ug/g	4.73	14	06/18/03 05/30/03	
► W030000533	817189	GPP TRENT	7440-02-0	Nickel by ICP-MS	SOLID	LA-505-412	ナ	5.48	ug/g	4.73	2.4	06/18/03 05/30/03	44000000
W030000533	B171B9	GPP TRENT	7782-49-2	Selenium by ICP-MS	SOUD	LA-505-412	υŹ	< 1.42	ug/g	4.73	14	06/18/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	7440-22-4	Silver by ICP-MS	SOLID	LA-505-412	E6/10	Halana in erini di bisan	ug/g	4.73	0.95	06/18/03 05/30/03	06/03/0
W030000533	B17169	GPP TRENT	7440-28-0	Thatlium by ICP-MS	SOLID	LA-505-412	W. V A	< 0.473	ug/g	4.73	0.47	06/18/03 :05/30/03	06/03/0
W030000533	B17189	GPP TRENT	7440-29-1	Thorium by ICP-MS	SOLID	LA-505-412	7	3.46	ug/g	4.73	0.95	06/18/03 05/30/03	06/03/0
_wo30000533	817189	GPP TRENT	7440-61-1	Uranium by ICP-MS	SOLID	LA-505-412	Ē	28.0	ug/g	4,73	0.47	06/18/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	7440-62-2	Vanadium by ICP-MS	SOLID	LA-505-412	$ ilde{oldsymbol{ au}}$	45.4	ug/g	4.73	1.9	06/18/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	7440-66-6	Zinc by ICP-MS	SOLID	LA-505-412	$\vec{\tau}$	25.4	ug/g	4.73	19	06/18/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	TPH-G	Total Pet. Hydrocarbons Gas	SOLID	NWTPH	U	< 500	ug/kg	A RE GENERAL BROK	5.0e+02	06/12/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	12674-11-2	Aroclor-1016	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	11104-28-2	Aroclor-1221	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03	06/03/0
W030000533	B17189	GPP TRENT	11141-16-5	Arccior-1232	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.18+02	06/13/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	53469-21-9	Aroclor-1242	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	12672-29-6	Araclar-1248	SOLID	LA-523-427	ប	< 110	ug/kg	1,00	1,1s+02	06/13/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	11097-69-1	Aroclor-1254	SOLID	LA-523-427	J	140	ug/kg	1.00	1.1e+02	06/13/03 05/30/03	06/03/0
W030000533	B17189	GPP TRENT	11096-82-5	Aroclor-1260	SOLID	LA-523-427	Ú	< 110	ug/kg	1.00	1.1s+02	06/13/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	37324-23-5	Aroclor-1262	SOLID	LA-523-427	ับ	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	11100-14-4	Arocler-1268	SOLID	LA-523-427	U	< 110	ug/kg	1.00	1.1e+02	06/13/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	13981-16-3	Pu-238 by AEA	SOLID	LA-508-471	U	-0.120	pCi/g	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0.32	06/17/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	E,T,C	Pu-238 by AEA Total Critis Error	SOLID	LA-508-471	file (1904)	140	%	11000	0.0	06/17/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOLID	LA-508-471		21.0	%		0.0	06/17/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	PU-239/240	Pu-239/240 by AEA	SOLID	LA-508-471	in in	3.90	pÇi/g	HEHH	0.077	06/17/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	120-82-1	1,2,4-Trichlorobenzene	SOLID	LA-523-456	U	< 1.50e+03	ug/kg	1.00	1.5e+03	06/09/03 05/30/03	06/03/0
W030000533	B171B9	GPP TRENT	95-50-1	1,2-Dichlorobenzene (SV)	SOLID	LA-523-456	13	< 1.90e+03	ug/kg	1.00	1.9e + 03	06/09/03 05/30/03	06/03/0

MDL=Minimum Detection Limit

E - Analyte is an estimate, has potentially larger errors

RQ=Result Qualifier

U - Analyzed for but not detected above limiting criteria.

J - Estimated Value

DF=Dilution Factor

* - indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

Report W004/ver. 5.1

Ground Water Protection Program

(0/18/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	WSCF20030757
Sample Matrix	Soil
Sample Visual	Brown
SAF Number	F03-006
Data Deliverable	Summary Report

Introduction

Six (6) soil samples (B171B9, B171C0, B17218, B17216, B17217 and B171C1) from the GPP were received at the WSCF Laboratory on June 3 & 4, 2003. The sample was analyzed for those analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the Groundwater Protection Program-Letter of Instruction, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and Request for Sample Analysis forms are included as Attachment 3.

Analytical Methodology for Requested Analyses

- PCB's by EPA SW-846 Method 8082. Analytical work was performed with no deviations to the approved procedure.
- ICP-MS Metals by EPA Method 200.8 and ICP-AES Metals by EPA SW-846 Method 6010A. Analytical work was performed with no deviations to the approved procedure.
- VOA's by EPA SW-846 Method 8260A. Analytical work was performed with no deviations to the approved procedure.
- Semi-VOA's by EPA SW-846 Method 8270B. Analytical work was performed with no deviations to the approved procedure.
- WTPH-D by WDOE Method NWTPH-Dx. Analytical work was performed with no deviations to the approved procedure.
- WTPH-G by WDOE Method NWTPH-Gx. Analytical work was performed with no deviations to the approved procedure.
- IC Anions and Ammonium by EPA SW-846 Method 300.0 and 300.7. Analytical work
 was performed with no deviations to the approved procedure for Ammonium, but a
 deviation was required for the Anions (see comments below).

- The pH by EPA Method 150.1. Analytical work was performed with no deviations to the approved procedure.
- Percent Solids by EPA Method 160.3. Analytical work was performed with no deviations to the approved procedure.
- Cyanide by EPA SW-846 Method 335.2. Analytical work was performed with no deviations to the approved procedure.
- All RadChem analyses (AEA's, GEA) were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved procedure.

Comments

PCB's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-58 for QC details.

ICP-MS and ICP-AES Metals – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-67, 2-68, and 2-69 for QC details.

VOA's – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-71 and 2-72 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

Semi-VOA's - The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-59, 2-60, 2-61, 2-62 and 2-63 for QC details. Compounds listed on the tentatively identified peak report with an "N" qualifier have been identified with the program used to interpret the raw data.

WTPH-D - The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-57 for details.

WTPH-G – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-70 for details.

IC Anions – The client requested hold time(s) for this analysis was not met. The client was notified and requested WSCF to continue with this analysis. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-54 and 2-55 for QC details.

NH4 – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-53 for QC details.

Percent Solids – PCB's, VOA's, Semi-VOA's, Alcohols and Glycols, WTPH-G and WTPH-D analytical results were corrected for percent solids. All other analytical results were reported for the sample as received.

CN – The hold time(s) for this analysis was met. A Laboratory Control Sample, Matrix Spike and Matrix Spiked Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-56 for QC details.

RadChem – There are no hold times associated with these WDOE accredited methods. Except for GEA, a Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GPP Letter of Instruction. See page(s) 2-64, 2-65, and 2-66 for QC details.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

Troy Dale

WSCF Production Control

<u>Abbreviations</u>

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline

Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

FH-Central Plate	au Project	CI	HAIN OF CUST	ODY/SA	MPLE	EANAL	YSIS	REQUE	ST	F03	-006-144	Page 1	of 1
Collector Johansen/Pope/Pfister			nny Contact Hulstrom	Telephone 373-392	No. 8	:	3 7	Project Coo TRENT, SJ	rdinator	Price Code 8N Data 1		Data Tur	
Project Designation 200-PW-2/200-PW-4 OU - I	Borehole Soil Sampling	Sampl 216	ing Location	24-03 - 30-33	4 5 (3	5.5-38	')	SAF No F03-006		Air Quality		60 1	Days ————
Ice Chest No.			Logbook No. F-N-3361		COA 117504ES	310	9	Method of S Governme	hipment nt Vehicle		·		
Shipped To 25 222-S Lab Operations 4	CF [4 3 03	Offsite N/A	Property No.			•	4.4	Bill of Ladi N/A	ng/Air Bill	No.			
POSSIBLE SAMPLE HAZ	ARDS/REMARKS												
			Preservation	Cool 4C	Cool 4C	None	Non						
Special Handling and/or	Storage	•	Type of Container	aG	aG	aG	aG					<u> </u>	
optom: Manager B and or		•	No. of Container(s)	2	1	7000-30-03	1.						
7.60	30757		Volume	40mL	40mL	(0)U/-	60m	L					,
N. N.	SAMPLE ANAL)	YSIS		VOA - 8260A - Complete	Sezi-VOA - 1270A (TCL); PCBs - 8082	See item (1) in Special Instructions.	See itent (Special Instructi	4					
` .			<u>.</u> :	STL	STL	W	E			TIETO:			
Sample No.	Matrix *	Sample Date	Sample Time										
B171B9 W0 30000537	SOIL	7-18-6	3 1140							BITIF]		
	<u> </u>												
		·											
· · · · · · · · · · · · · · · · · · ·	<u> </u>												
CHAIN OF POSSESSION		Sign/Print			SPE	CIAL INSTR	UCTIO	NS					Matrix *
THEMENTAL	W 5-30 13 149	Received By/Stor	2777 Ref 5-30	us 1415	וליי	The laboratory is	to report	both kerosene	und diesel ran	ge compounds from	n WTPH-D an	alysis.	S=Soi) SE=Sediment
Relinquished By/Removed From	Date/Time F 6/03/03 /3/5	Received BylSto	ed In D	ate/Time 13/5	(1) (2)					ium-152, Europium			SO=Sotid SI=Sludge W = Water
Relinguished By/Removed From	- 6/03/03 /3/5 - L Date/Time /4/00	Received By/Sud	no Great Lynn	25 6/3/6 nte/Time / 14	Pluto	mium; Americiu	տ-241; և	otopic Uranium	: Total Urani	un-226, Radium-22 un; ICP Metals - 6	010A (SW-84	6)	O-Oil
Circ Thornas Trus	Aunax Clospos	Y DE	X / Kake	6/3/03	6010	A (Add-on) (Bi	ismuth, B	orom, Lead, Sele	nium); Merci	ium, Copper, Nicke ury - 74,71 = (CV),	(C Anions - 30	0.00	DS=Drum Solids DL=Drum Liquid
Relinquished By/Removed From	Date/Time	Received By/Stor	ed In D	atc/Time	350,1	1; pH (Soil) - 90	45		_	, Sulfate); Total C			T=Tissue W[=Wipe L=Liquid
Relinquished By/Removed From	Date/Time	Received By/Stor	ed In D	ate/Time	1 120		į.	7	•	rium (Thorium 23)		-	V=Vegetation X=Other
Relinquished By/Removed From	Date/Time	Received By/Stor	ed in D	nte/Time		THE	به مع		/	/mar	106-0	5-03	
LABORATORY Received E SECTION	y .	<u>- I</u>		Title	 _	· <u>-</u>		·	<u> </u>	· ·		Date/Time	<u> </u>
FINAL SAMPLE Disposal M	(ethod			<u> </u>		Dispo	sed By	·	·		 	Date/Time	

#1-200.8 & 6010 / man 06-05-03

Appendix 5

Data Validation Supporting Documentation

LEVI	EL:	Λ	В		D	E
PROJ	JECT: 20	0-86-2/200	>-PW-4	DATA PACKAG	E: WSCF2	0030757
VAL	IDATOR:	TU	LAB: しょう	CF	DATE: 10	18/03
CASI	E:				0757	·
			ANALYSES	PERFORMED		· · · · · · · · · · · · · · · · · · ·
SW-8	846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
	B713					
						7
		······································	······································			Sail
	ical verificat	ion documentation p	wesent?	CASE NARRATIV	E	
	ical verificat	ion documentation p	wesent?		E	
Comm	ical verifications: INSTRUIT	MENT PERFORM	IANCE AND CAL	IBRATIONS (Lev	E els D and E)	Yes No/
Comm 2. Initial	INSTRUI calibrations	MENT PERFORM performed on all ins	IANCE AND CAL	IBRATIONS (Lev	els D and E)	Yes No
Comm 2. Initial Initial	INSTRUI calibrations calibrations aterference ch	MENT PERFORM performed on all imacceptable?	IANCE AND CAL	IBRATIONS (Lev	els D and E)	Yes No 1
2. Initial ICP in	INSTRUI calibrations aterference ch	MENT PERFORM performed on all insects acceptable?	IANCE AND CAL	JBRATIONS (Lev	els D and E)	Yes No
2. Initial Initial ICP in	INSTRUI calibrations calibrations aterference ch	MENT PERFORM performed on all insacceptable? ecks acceptable?	IANCE AND CAL	IBRATIONS (Lev	els D and E)	Yes No Yes No Yes No Yes No Yes No
2. Initial Initial ICP in ICV as ICV as	INSTRUI calibrations calibrations aterference ch and CCV check ands traceable	MENT PERFORM performed on all insacceptable?	IANCE AND CAL	IBRATIONS (Lev	els D and E)	Yes No Yes
2. Initial ICP in ICV as ICV as Standa	INSTRUI calibrations calibrations aterference ch and CCV chee ards traceable ards expired?	MENT PERFORM performed on all insects acceptable? cks performed on all cks acceptable?	IANCE AND CAL struments?	IBRATIONS (Lev	els D and E)	Yes No

3. BLANKS (Levels B, C, D, and E)			_
ICB and CCB checks performed for all applicable analyses? (Levels D, E)		Yes	NO NIA
ICB and CCB results acceptable? (Levels D, E)		Yes	No (N/A
Laboratory blanks analyzed?		Yes	No N/A
Laboratory blank results acceptable?	7	Yes	No N/A
Field blanks analyzed? (Levels C, D, E)	***************************************	Yes(NA GR
Field blank results acceptable? (Levels C, D, E)	******************	Yes	No (N/A
Transcription/calculation errors? (Levels D, E)		Yes	No NA
Comments:			
4. ACCURACY (Levels C, D, and E)			
MS/MSD samples analyzed?	~~***********	Yes(No N/A
MS/MSD results acceptable?		Yes (No MA
MS/MSD standards NIST traceable? (Levels D, E)	******************	Yes	No NA
MS/MSD standards expired? (Levels D, E)	***************************************	Yes	No NA
LCS/BSS samples analyzed?	18 da jaz sa 2400 ta 220 a 220 a 220 a	(Ye)	No N/A
LCS/BSS results acceptable?	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Yes (No N/A
Standards traceable? (Levels D, E)		Yes	No N/A
Standards expired? (Levels D, E)		Yes	No MA
Transcription/calculation errors? (Levels D, E)		Yes	No NA
Performance audit sample(s) analyzed?	*******************	Yes /	No N/A
Performance audit sample results acceptable?	******	Yes	No (N/A
Comments: Bismuth LCS 54,890 - Jal		*	
Andmay - LCS 73.5 I all			
aluminum - NO MS I			
Silver 5% - UR			
	No	PAS	

5.	PRECISION (Levels C, D, and E)			
Duplic	cate RPD values acceptable?	Yes	NB	N/A
	rate results acceptable?		\	
MS/M	SD standards NIST traceable? (Levels D, E)	Yes	No	(N/A)
MS/M	SD standards expired? (Levels D, E)	Yes	No	MA
	luplicate RPD values acceptable?			× ~
Field s	plit RPD values acceptable?	Yes	No	MA.
Transc	cription/calculation errors? (Levels D, E)	Yes	No	AZV.
Comm	ents: NO Dup ICP-Mg - Jal		·*	
6.	ICP QUALITY CONTROL (Levels D and E)	•		1
ICP se	rial dilution samples analyzed?	Yes	No	N/A
ICP se	erisl dilution %D values acceptable?	Yes	No	NAM.
ICP po	ost digestion spike required?	Yes	No	N/A
ICP po	ost digestion spike values acceptable?	Yes	No	N/A
	ards traceable?			
Stands	irds expired?	Yes	No	N/A
Transc	cription/calculation errors?	Yes	Nd	NA
Comm	nents:		············	<u>V</u>
		·		
		· - 		

BHI-01435 Rev. 0

7. FURNACE AA QUALITY CONTROL (Levels D and E)			
Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?			
Analytical spikes performed as required?			
Analytical spike recoveries acceptable?			•
Standards traceable?			,
Standards expired?			1
MSA performed as required?			
MSA results acceptable?			
Transcription/calculation errors?			
Comments:		,	$\overline{}$
8. HOLDING TIMES (all levels)	\bigcirc		
Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A
Comments:			
			

9. RESULT QUANTITATION AND DETECTION LIMITS (all	levels)
Results reported for all requested analyses?	Yes No N/A
Rresults supported in the raw data? (Levels D, E)	Yes No NA
	= '
Samples properly prepared? (Levels D, E) Detection limits meet RDL? Transcription/calculation errors? (Levels D, E)	No NA
Transcription/calculation errors? (Levels D, E)	Yes No NA
Comments: Silver, lead, Beryllin com	
<u> </u>	

Appendix 6

Additional Documentation Requested by Client

SDG Number: WSCF20030757 Matrix: SOLID Test: ICP-2008 MS All possible metal

SAF Number: F03-006

Sample Date: 06/03/03 Receive Date: 06/03/03

rest: iv	P-2008 MS All possible m	etai			Receiv	ve Date: 06/	03/03
QC Type	Analyte	CAS#	Results	Units	Analysis Date	Lower Limit	Upper Limit
Lab ID							
BATCI	I QC ASSOCIATED WITH	SAMPLE					
MS	Silver by ICP-MS	7440-22-4	5.354	% Recov	06/18/03	70.000	130.000 •
MS	Aluminum by ICP-MS	7429-90-5	n/a		06/18/03	70.000	130.000
MS	Arsenic by ICP-MS	7440-38-2	97.980	1.00000000 14.00000	06/18/03	70,000	130.000
MS MS	Barium by ICP-MS Beryllium by ICP-MS	7440-39-3 7440-41-7	105.051 99.495		06/18/03	70.000	130.000
MS	Cadmium by ICP-MS	7440-43-9	97.475	n neggyeggag, tuggstadd	06/18/03 06/18/03	70,000 70.000	130.000
MS	Cobelt by ICP-MS	7440-48-4	93.939	se and the second second	06/18/03	70.000	130.000 130.000
MS	Chromium by ICP-MS	7440-47-3	96.465	aut Vivin 1996 au	06/18/03	70.000	130.000
MS	Copper by ICP-MS	7440-50-8	92,929	% Recov	Q6/18/03	70.000	130.000
MS	Mercury by ICP-MS	7439-97-6	95.565	% Recav	06/18/03	70.000	130.000
MS	Manganese by ICF-MS	7439-98-5	104,545	% Recov	08/18/03	70.000	130.000
MS	Molybdenum by ICP-MS	7439-98-7	94.949		06/18/03	70.000	130.000
MS	Nickel by ICP-MS	7440-02-0	96,970		06/18/03	70.000	130.000
MS MS	Lead by ICP-MS	7439-92-1 7440-36-0	104.040		06/18/03	70.000	130.000
MS	Antimony by ICP-MS Selenium by ICP-MS	7782-49-2	88.889 95.455	and the second of the second o	06/18/03 06/18/03	70.000 70.000	130,000 130,000
MS	Therium by ICP-MS	7440-29-1	101.515		06/18/03	70.000	130.000
MS	Thailium by ICP-MS	7440-28-0	98.990		06/18/03	70.000	130.000
MS	Urenium by ICP-MS	7440-61-1	97.980		06/18/03	70.000	130,000
MS	Vanadium by ICP-MS	7440-82-2	98.485	% Recov	06/18/03	70.000	130.000
MS	Zine by ICP-MS	7440-86-8	97,980	% Recov	06/18/03	70.000	130.000
ВАТСН	r QC						
BLANK	Silver by ICP-MS	7440-22-4	< 0.200	ug/L	06/18/03	-0.440	0.440
BLANK	Aluminum by ICP-MS	7429-90-5	<11.0	ug/L	06/18/03	-24.200	24.200
BLANK	Arsenic by ICP-MS	7440-38-2	<0.300	ug/L	06/18/03	-0.660	0.860
BLANK	Barium by ICP-MS	7440-39-3	<0.200	ug/L	08/18/03	-0.440	0.440
BLANK	Beryllium by ICP-MS	7440-41-7	< 0.300	ug/L	06/18/03	-0.660	0.660
BLANK BLANK	Cadmium:by ICP-MS Cobalt by ICP-MS	7440-43-9 7440-48-4	<0,100 <0.200	ug/L ug/L	06/18/03 08/18/03	-0.220 -0.440	0.220 0.440
BLANK	Chromium by ICP:MS	7440-47-3	<0.300	ug/L	06/18/03	-0,660	0.660
BLANK	Copper by ICP-MS	7440-50-8	< 0.500	ug/L	06/18/03	-1.100	1.100
BLANK	Mercury by ICP-MS	7439-97-6	<0.100	ug/L	06/18/03	-0.220	0.220
BLANK	Manganese by ICP-MS	7439-96-5	<0.300	ug/L	06/18/03	-0.860	0.660
BLANK	Molybdenum by ICP MS	7439-98-7	<0.300	ug/L	06/18/03	-0,660	0.660
BLANK	Nickel by ICP-MS	7440-02-0	<0.500	ug/L	06/18/03	-1.100	1.100
BLANK	Lead by ICP-MS	7439-92-1	<1,20	ug/L	06/18/03	-2.640	2.640
BLANK	Antimony by ICP-MS	7440-36-0 7782-49-2	0.505 <0.300	ug/L am/l	06/18/03 06/18/03	-1.100 -0.660	1.100 Ø.660
BLANK BLANK	Selenium by ICP-MS Thorium by ICP-MS	7440-29-1	< 0.200	ug/L ug/L	06/18/03	-0.440	0.440
BLANK	Theflum by ICP-MS	7440-28-0	<0.100	ug/L	06/18/03	-0.220	0.220
BLANK	Uranium by ICP-MS	7440-61-1	<0.100	υg/L,	06/18/03	-0.220	0.220

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SDG Number: WSCF20030757 Matrix: SOLID Test: ICP-2008 MS All possible metal

SAF Number: F03-006

Sample Date: Receive Date:

QC					Analysis	Lower	Upper
Type	Analyte	CAS#	Results	Units	Date	Limit	Limit
BLANK	Vanadium by ICP-MS	7440-62-2	<0.400	ug/L	06/18/03	-0.880	0.880
BLANK	Zinc by ICP-MS	7440-86-6	<4.00	ug/L	06/18/03	-8.800	8.800
LCS	Silver by ICP-MS	7440-22-4	127.731	% Recov	06/18/03	85,000	116.000
LCS	Aluminum by ICP-MS	7429-90-5	95.745	% Recov	06/18/03	85.000	115.000
LCS	Arsenic by ICP-MS	7440-38-2	100.000	% Recov	06/18/03	85.000	115.000
LCS	Barium by ICP-MS	7440-39-3	96.429	% Recov	06/18/03	85.000	115.000
LCS	Beryllium by ICP-MS	7440-41-7	101,195	% Recov	06/18/03	85.000	115.000
LC\$	Cadmium by ICP-MS	7440-43-9	97.376	% Recov	06/18/03	85.000	115.000
LCS	Cobalt by ICP-MS	7440-48-4	91,329	eu i prophae saffectores	06/18/03	85,000	175.000
LCS	Chromium by ICP-MS	7440-47-3	88.786	the second second second	06/18/03	B5.000	115.000
LCS	Copper by ICP-MS	7440-50-8	94,488	(1)040 LP 08104 ASSOC	06/18/03	85.000	115.000
LCS	Mercury by ICP-MS	7439-97-8	89.479	successive services and a service and a s	06/18/03	85.000	115.000
LCS	Manganese by ICP-MS	7439-96-5	93,333	1984 - HWW 1990 C	06/18/03	85.000	115,000
LCS	Molybdenum by ICP-MS	7439-98-7	94.545	e non suo avisti Autonomon	06/18/03	85.000	115.000
LCS	Nickel by ICP-MS	7440-02-0	104.904		06/18/03	85.000	115,000
LCS	Lead by ICP-MS	7439-92-1	103.386	s in the second second	06/18/03	85.000	115.000
LCS	Antimony by ICP-MS	7440-36-0	73,913		06/18/03	85,000	115,000
LCS	Selenium by ICP-MS	7782-49-2	103.509	the control of the state of the	06/18/03	85.000	115.000
LCS	Thorium by ICP-MS	7440-29-1	98.222		08/18/03	85.000	115,000
LCS	Thallium by ICP-MS	7440-28-0	106.426	Antonio de Companyo de Como de Caracterio de	06/18/03	85.000	115.000
LCS	Uranium by ICP-MS	7440-61-1	98,992	AN AM REPORT OF THE	06/18/03	85.000	115,000
LCS	Vanadium by ICP-MS	7440-62-2	93.293		06/18/03	85.000	115.000
LCS	Zinc by ICP-MS	7440-66-8	101,509	% Recov	06/18/03	85.000	115,000

SDG Number: WSCF20030757

Matrix: SOLID

Test: ICP Metals Analysis, Grd H20 P

SAF Number: F03-006 Sample Date: 06/03/03

Receive Date:

06/03/03 06/03/03

QC
Type Analyte CAS # Results Units Date Limit Limit

Lab ID: W030000530

BATCH QC ASSOCIATED WITH SAMPLE

M5	Boron by ICP	7440-50-8	91,238	% Recov	06/25/03	75.000	125,000
MS	Bismuth by ICP	7440-69-9	97.340	% Recov	06/25/03	75.000	125.000
MSD	Boron by ICP	7440-50-8	90,998	% Recov	08/25/03	75.000	125,000
MSD	Bismuth by ICP	7440-69-9	98.000	% Recov	06/25/03	75.000	125.000
SPK-RPO	Baron by ICP	7440-50-8	0,263	RPD	06/25/03	0,000	20.000
SPK-RPD	Biamuth by ICP	7440-69-9	0.676	RPD	06/25/03	0.000	20.000

BATCH QC

BLANK	Boron by ICP	7440-50-8	2.9	ug/L O	6/25/03	-10.000	10.000
BLANK	Bismuth by ICP	7440-69-9	< 0.1	ug/L 00	6/25/03	-1.000	0.068
LCS	Baron by ICP	7440-50-8	98,827	% Recay O	8/25/03	80.000	120.000
LCS	Bismuth by ICP	7440-69-9	54.809	% Recov Of	6/25/03	80.000	120.000 +